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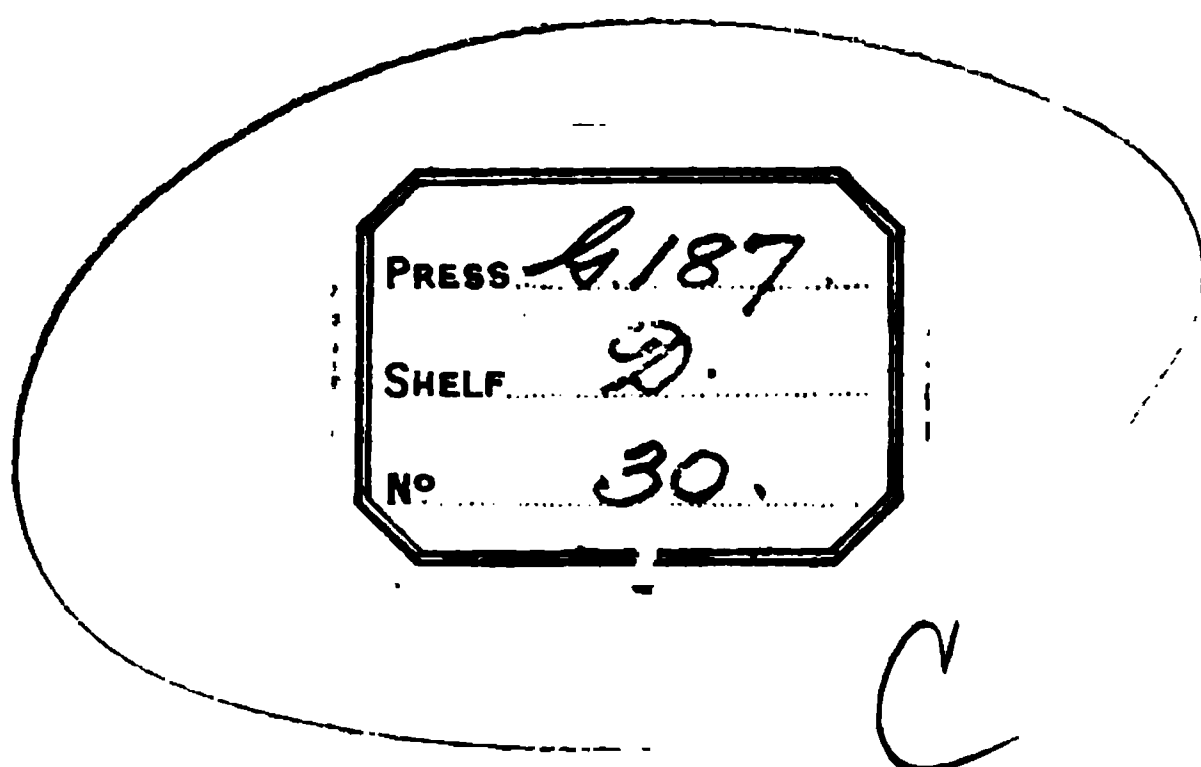
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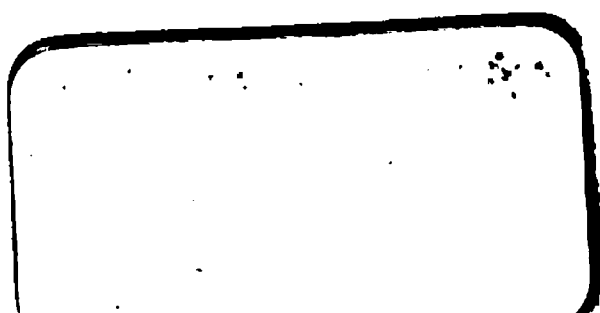
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ILLUSTRATIONS

OF

MR. S. COOPER'S

SURGICAL DICTIONARY.

BY W. P. COCKS,

SURGEON.



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P R E F A C E.

IN commencing the Second Volume of the “*Illustrations*,” the Author gratefully acknowledges the kindness and liberality with which his undertaking has been received and fostered by the profession generally, and also the many valuable hints for improvements suggested by his personal friends during the progress of the first volume.

It was originally intended to confine the verbal part of the work to a brief description of the plates only, but in many instances the information thus imparted was too meagre for the perfect elucidation of the subject ; the sphere of observation has therefore been considerably enlarged, and, it is hoped, the utility of the book correspondingly increased.

It now contains, in addition to its first pretensions,—anatomical notices of the parts illustrated,

together with the various methods of operating practised by the most eminent surgeons in England and on the Continent, with references, as before, to that imperishable work the Surgical Dictionary, to the service of which it is especially devoted. While a reference to the plates will be refreshing to the memory of the practitioner, the student will derive some benefit if his attention be directed only to the consideration of how far the fidelity of the delineations is borne out by his own observations. To excite this curiosity will be to answer the utmost hopes of the author ; the object of his highest ambition being, in however slight a degree, to promote inquiry, which naturally tends to the advancement of knowledge in every science, and which is an indispensable requisite in that profession which, as it mitigates “ the thousand ills that flesh is heir to,” is justly classed among the most noble in which the human intellect can be engaged.

London, 1833.

C O N T E N T S.

Anterior Regions of the Head and Neck
Posterior ditto

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Occipital ditto
Parotideal ditto
Nasal ditto
Orbital ditto
Zygomato-Maxillary ditto
Masseteric ditto
Genial ditto
Mental ditto
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EXPLANATION OF PLATES.

PLATE I.

Represents the anterior regions of the head and neck.

PLATE II.

The lateral regions of the head and neck.

These diagrams are intended to illustrate Monsieur Velpeau's* mode of dividing the human figure into regions† by arbitrary

* "Surgical Anatomy; or, the Anatomy of Regions. By M. Velpeau."

† M. Velpeau says, "To examine the organic systems, and whatever they possess in common in every part of the body, is the object of general anatomy; to study the apparatuses in succession, to describe the figure, volume, position, density, and composition of each organ, is the province of descriptive, or special anatomy; to take a certain portion of the economy, describe all the elements which are comprised within it, and point out the peculiarities which each of them present; the direction and exact relations of the most important objects; the varieties of thickness and position produced by diseases or aberrations of development; to proceed from the skin towards the bones, or from the bones towards the surface, and thus observe successively, and layer by layer in their relative and

lines, † so that the surgeon may at all times foresee, previous to performing any operation,

natural position, the different parts, without entering into minute details;—this is what constitutes the anatomy of regions or of relations, or topographical anatomy.

“The first, more particularly concerned with the fibrillary arrangement, and the analysis of the intimate structure of the tissues, is the basis of all sound physiology; without it, medicine would never have emerged from that confusion of principles which so long prevailed in the schools. It truly deserves the title of medical anatomy.

. “The second, displaying the organs in the manner which nature presents them, describing their most prominent characters, without investigating their molecular disposition, or those unknown vital properties from which they derive life and motion, appertains, more directly to surgery, which owes to it its rapid progress, and the certainty with which it is honoured; without it, the surgeon would be but a dangerous man.

“The third is yet altogether new, and can only be considered as a complement to the two others. It differs from common descriptive anatomy, both by the end which it proposes and the means it employs. This takes up an apparatus of organs, and follows it to every part to which it is distributed, previous to taking up the consideration of the others; that, on the contrary, passes on review all the elements of a circumscribed point, without investigating either their origin or termination. The one tends to make known the special functions of the economy; the other, to expose the different characters of this or that part of the body; to give the mechanical reason for the divers phenomena which we remark in it; to explain the difference in the dangers and forms of diseases, by the difference in the relative and visible disposition of the systems which compose this or that region. It dwells upon some organs, passes lightly over others, always seeks to place itself in relation with operations; in a word, it is the anatomy

all the accidents which may immediately follow it, and all the precaution which it requires relatively to the parts which should be preserved or avoided ; by the aid of which, any point of the body being given, it will be possible to tell, within a few lines, what are the fibrillæ, arteries, veins, nerves, muscles, &c. which must lie in the way of the instrument.

THE CRANIUM.

This part of the head may be divided into three regions on each side of the median line ; as, for example, the frontal, temporo-parietal, and occipital regions.

The Frontal Region.

It is triangular, and bounded, inferiorly, by a curved line extending above the eye-brow, from one of the orbital processes of the os frontis to the other ; internally, by the median line, which separates it from its fellow on the opposite side ; and externally, by a third line which

which is most intimately connected with external pathology, and which, for this reason, is called surgical."

‡ "The great natural sections of the body being insufficient, I have substituted for them arbitrary lines, which I have connected as much as possible with osseous or muscular eminences. These lines seem to me to present the inappreciable advantage of embracing, in a given region, objects which can only afford surgical interest so long as we consider them united, and in their natural connexions."

ascends from the external orbital process, in the course of the fronto-parietal suture, to the origin of the sagittal suture.

The surface of this region presents, inferiorly, a transverse furrow of greater or less breadth ; in the middle, a more or less prominent bump, constituting the frontal groove and protuberance ; internally, the frontal vein and some one of its branches ; and, superiorly, the hair, which descends more or less in different individuals.

Temporo-Parietal Region.

It is of a quadrangular form, and bounded, inferiorly, by a line drawn from the external orbital process, along the superior border of the zygomatic arch, and terminating at the fore part of the mastoid process ; superiorly, by the analogous region of the opposite side ; anteriorly, by the external boundary of the frontal region ; and, posteriorly, by a line extending from the anterior part of the mastoid process, to the junction of the sagittal with the lambdoidal suture.

Upon its surface we observe, between the ear and frontal region, above the zygoma, sometimes a convexity, at others a concavity, according to the embonpoint of the individual, and the volume of the temporal muscle.

Above the temporal fossa, we find a broad and

regularly circumscribed prominence ; this is the parietal protuberance.

Occipital Region.

Its figure resembles that of the frontal region ; that is to say, supposing it to be flattened out, it is triangular. Its boundaries are, anteriorly, the preceding region ; upon the median line, its fellow of the opposite side ; inferiorly, a line extending from the apex of the mastoid process to the occipital protuberance.

Parotideal Region.

Its form is pyramidal ; the base of the pyramid corresponding with the skin—its apex to the pharynx. It is bounded, superiorly, by the temporal region ; posteriorly, by the anterior margin of the sterno-mastoid muscle ; anteriorly, by the posterior border of the inferior maxillary bone ; and, inferiorly, by a line drawn from the angle of the jaw across the sterno-mastoid muscle. Its surface presents a gutter, which is deeper in the aged, in men, adults, and those of a spare habit, than in children, women, and those who are corpulent. This gutter is continued downwards into the supra-hyoideal region ; upwards to the lobe of the ear ; afterwards, in passing between the auricle

and mastoid process, it forms only a simple furrow : this is the mastoido-auricular furrow. We feel, in the parotideal region, quite near the anterior aspect of the tragus, a small prominence, which is carried forwards when we depress the jaw ; this is the maxillary condyle. When the mouth is shut, there exists, between this prominence and the masseter, in emaciated persons, who have not a very large parotid, a slight excavation. This depression corresponds to the posterior part of the sigmoid notch of the jaw, and at this part we might easily introduce a pointed instrument into the zygomatic fossa. From this superficial situation of the condyle, its fractures may be easily detected, by pressing the finger upon it, and at the same time depressing the jaw.

Nasal Region.

It is bounded superiorly by the frontal ; inferiorly, by the labial ; and, on each side, by the orbital and zygomato-maxillary regions.

Orbital Region.

This region comprehends the whole of the apparatus of vision, and the greater part of the lachrymal apparatus. It is bounded by the circumference of the orbit, and consequently has the nasal region internally, the temporal

externally, the frontal superiorly, and the zygomatico-maxillary inferiorly. It presents for our consideration the orbital arches, the eye-lids, the palpebral angles, the eye, and the orbit.

Zygomato-Maxillary Region.

It comprises all the parts which compose the malar protuberance, on the one hand ; on the other, the canine fossa, and all the organs which cover it. It is bounded, superiorly, by the orbital region ; inferiorly, by the genial region ; externally, by the temporal and masseteric regions, and internally, by the nasal region.

This region presents, superiorly and externally, the jugal eminence, which is more or less sharp or rounded, more or less prominent, according to the nation, age, sex, and individual ; and which has much influence over the expression of the countenance.

Internally, and below this protuberance, there is, in many subjects, a groove, which runs obliquely downwards and outwards, extending from the great angle of the eye to the genial region, and separating the fossa canina from the molar protuberance : this is the naso-jugal furrow,* above which we find the orbicularis

* M. Jadelot calls this furrow the oculo-zygomatic trait, and considers it a diagnostic sign of diseases of the cerebro-spinal system in children.

palpebrarum, and superior portion of the zygomatic muscles, which it crosses ; below it are the levators of the nose and lip, and the buccinator. Another oblique furrow extends in the same direction, from the ala nasi to the angle of the lips : this is the naso-labial furrow, which separates the labial region from the one under consideration, and which is more constant than the preceding.*

Masseteric Region.

It is bounded by the margins and attachments of the masseter muscle. Consequently, we find anterior to it the zygomato-maxillary and genial regions ; posteriorly, the parotideal ; superiorly, the temporal ; and, inferiorly, the supra-hyoideal regions.

Upon the face of most subjects it forms a prominence, which varies in proportion to the size of the parotid and masseter, and especially to the inclination of the angle of the jaw.

Genial Region.

It is wedged, as it were, between the mental, labial, zygomato-maxillary, masseteric, and sub-maxillary regions. Its limits cannot be

* This M. Jadelot calls the nasal trait, and refers it to affections of the abdominal organs.

otherwise than arbitrary, and its surgical importance is particularly derived from salivary fistulæ and the passage of the facial artery.

It is sometimes prominent, at others excavated; and in many individuals it presents one or two fossettes, which are owing to the contraction of the muscles.

Mental Region.

This region is bounded on each side by the preceding; superiorly, by the inferior labial groove; and, inferiorly, by the supra-hyoideal region. It forms the inferior part of the face, and makes a projection, which varies according to age, sex, embonpoint—age especially; in the middle of it, and inferiorly, we sometimes observe, during the elevation of the lower lip, a slight dépression, or dimple.

Labial Region.

This region comprehends the two lips, and is bounded, superiorly, by the nose, and the nasolabial furrow; inferiorly, by the mento-labial groove;* and laterally, by the fossette at the angle of the lips.

* M. Jadelot states, that this furrow constitutes the mental feature, and is concerned in affections of the chest.

Supra-Hyoidean Region.

It is bounded superiorly by the base of the lower jaw, and the floor of the mouth ; a little more posteriorly, by the parotideal region ; inferiorly, by the os hyoides, and its cornua arbitrarily prolonged to the sterno-mastoid muscle ; laterally, by the anterior margin of this muscle. Broadest in the middle, it afterwards gradually becomes narrower, in order to terminate in a point upon the sides. From before backwards, and from above downwards, it forms an oblique plane, which rises or sinks in accordance with the motions of the tongue or larynx. In some individuals, it forms a very distinct semilunar prominence, which is separated from the jaw by a groove of greater or less depth,—this is called the double chin. Posteriorly, at its entrance into the parotideal excavation, it becomes more concave.

Infra-Hyoidean Region.

This region is bounded, laterally, by the sterno-mastoid eminences ; inferiorly, by the supra-sternal notch ; and superiorly, by the preceding region. It represents a pretty regular triangle, with its base turned upwards. Upon the median line we may discover, by the sight

or touch, from above, downwards in the first place, a horizontal semi-circular depression, which corresponds to the thyro-hyoidean membrane ; next, the laryngeal eminence (*pomum Adami*), formed by the thyroid cartilage, and much more prominent in the adult man than in women and children ; lower down, an excavation, which points out the crico-thyroid membrane ; next, the prominence occasioned by the cricoid cartilage ; below this, a lesser eminence, which indicates the upper part of the trachea ; and lastly, the infra-thyroidal depression, which is deeply excavated in those who are emaciated,—superficial, and scarcely perceptible, in those of a full habit of body. In an adult male, of middle stature, the head being slightly thrown back, the distance from the *os hyoides* to the sternum is six inches ; from the *os hyoides* to the sinus of the thyroid gland, two inches and a half ; from the inferior margin of this gland to the sternum, two inches and a half likewise. At the inferior part of this region, the two sterno-mastoid muscles are only one inch asunder ; at its upper part, three inches.

Supra-Clavicular Region.

The supra-clavicular is bounded, anteriorly, by the sub-hyoidean, sub-maxillary, and parotideal re-

gions,—that is to say, by a line drawn from the sterno-clavicular articulation along the anterior margin of the sterno-mastoid muscle to the anterior part of the mastoid process ; posteriorly, by another line extended from the acromio-clavicular articulation, along the anterior border of the trapezius, to the posterior part of the mastoid process ; and inferiorly, by the clavicle and first rib. Consequently, it forms a regular triangle, with its base below.

Upon its anterior limit, we observe an elongated eminence, which is very evident when the head is inclined towards the shoulder, and the face to one side, and which is formed by the sterno-mastoid muscle. The trapezius forms another relief posteriorly, which is blended at the summit with the preceding eminence. In the interval of these two species of columns, there is an excavation, which is deeper in the adult than the child, in man than in woman, in thin than in fat subjects ; and which is increased or diminished according to the elevation or depression of the shoulder. This is the supra-clavicular excavation, and is the most important part of the region, whether we consider it in relation to the numerous organs it includes, the diseases which are developed in it, or the operations which may be performed upon it.

Posterior Region of the Neck.

The posterior region, or nape of the neck, is bounded, superiorly, by the occipital protuberance, transverse ridge, and mastoid process; inferiorly, by a transverse line, drawn from the superior angle of one scapula to that of the other, along the cervical margin of these bones; and laterally, by the supra-clavicular region, or a line dropped from the mastoid process upon the acromio-clavicular articulation.

This region is rounded and narrow in the middle; broader, and projecting backwards, superiorly; plane and still broader inferiorly; and of various lengths and thicknesses in different subjects. These peculiarities generally depend upon its degree of prominence, the elevation or depression of the shoulders, and the development of the muscles and other soft parts.

Upon its surface we observe, from above downwards, the external occipital protuberance, which is more prominent in some individuals than in others, and corresponds with the Torcular Hierophili, within the cranium; below this, a triangular excavation, bounded laterally by an eminence occasioned by the complexi muscles. This hollow is called the pit of the neck, and is the place where issues are made. It is bounded inferiorly by the spinous process of the dentatus. It corresponds to

the space which separates the os occipitis from the atlas, and an instrument introduced through it might easily wound the medulla oblongata. More inferiorly, we observe merely a simple furrow, and that only when the head is in extension; this furrow is the continuation of the preceding triangular excavation. The muscles likewise form an eminence on each side; but this is only seen when the furrow exists, and during their contraction. In the bottom of this furrow, we with difficulty feel the spinous processes of the cervical vertebræ. At the most inferior part of the region, we see the spine of the seventh vertebra, which generally makes a very distinct prominence.

THORACIC EXTREMITIES.

The thoracic extremities are divided into, the shoulder—the arm—the elbow and the forearm—the wrist, and the hand.

THE SHOULDER.

It is divided into an anterior, or thoraco-humeral region ; and a posterior, or scapulo-humeral region.

The Thoraco-humeral, Subclavian, or Axillary Region.

The axillary, or anterior region of the shoulder, is the most important of the superior extremity. It is bounded, superiorly, by the supra-clavicular region ; inferiorly, by the free margin of the pectoralis major ; externally, by a line which would fall perpendicularly from the apex of the acromion upon the free extremity of the thumb, in the direction of the external border of the limb, which line we call acromio-digital ; and, internally, by another line, drawn from the clavicle, one inch external to

the sterno-clavicular articulation, in order to terminate upon the anterior and superior spinous process of the os ilium, and which we call clavi-coxal. The surface of this region presents, superiorly and externally, a spherical prominence, which corresponds to the anterior part of the head of the humerus ; on the inner side of this convexity, a broad and superficial groove, which corresponds to the hollow of the axilla.

This groove, more strongly marked in emaciated individuals, increases in depth when the arm is approximated to the trunk, and presents several points worthy of consideration. Superiorly, we observe a triangular depression, by which we may easily penetrate into the articulation. If we apply the thumb upon this space, we feel that it is limited externally by the head of the humerus, internally by the coracoid process, and superiorly by the clavicle and acromion.*

Below this groove we meet with the anterior margin of the axilla, a species of rounded arch with its concavity directed downwards, when the arm is pendent ; but straight and tense, when elevated. It is of considerable thickness in corpulent subjects ; very thin,

* It is at this point that MM. de Champesmes and Lisfranc have proposed introducing the knife for the purpose of amputating the arm at the joints.

and sometimes almost cutting, in those who are emaciated.

Behind this border, we find an excavation, which is increased in depth as the arm is lowered, and becomes more superficial in proportion as it is raised. This excavation is triangular, with its base resting upon the thorax. It is bounded, posteriorly, by another border similar to the preceding, which is formed by the anterior portions of the *teres major* and *latissimus dorsi* muscles. This is the posterior margin of the axilla. If we pass the fingers into the axilla, we may feel through the skin, when the subject is not very fat, the lymphatic glands, the head of the humerus, the nerves of the brachial plexus, and sometimes even the pulsations of the humeral artery.

Posterior Region of the Shoulder.

This region is naturally bounded, posteriorly, by the spinal border of the scapula ; anteriorly, by the acromio-digital line ; superiorly, by the supra-clavicular region ; and, inferiorly, by the posterior margin of the axilla. It represents a triangle with its truncated summit directed forwards. Its surface presents several prominences and depressions, which may easily be distinguished through the skin ; thus, posteriorly, we may distinctly feel through the tra-

teriorly, by the hollow of the axilla, and, inferiorly, by a transverse line, which would unite the two preceding two inches above the condyles of the humerus. This region comprises the external and internal bicipital furrows, the eminence which separates them, the deltoidal depression, and a portion of the muscular relief which surmounts it.

Posterior Brachial Region.

This region is much less complicated than the preceding, and of minor importance in surgery. In its superior portion, it presents a part of the deltoidal eminence, and of the posterior groove of the same name ; as for the rest, it is rounded and convex.

THE ELBOW.

Under this title we comprehend that portion of the superior extremity which is circumscribed, superiorly, by the circular line which forms the inferior boundary of the arm ; and, inferiorly, by another circular line drawn three inches below the humeral condyles.

The elbow, like the arm, will be divided into anterior and posterior regions.

Anterior Region of the Elbow, or Fold of the Arm.

This region is very important with respect to venesection and aneurisms, which frequently have their seat in it. Its surface presents, superiorly, the termination of the bicipital prominence; externally and internally, two other muscular eminences, which converge towards one another, and at length become conjoined at their entrance into the anti-brachial region. These last are separated, superiorly, by the first prominence, and, inferiorly, by a triangular depression of greater or less depth. This excavation, which is prolonged upon the fore-arm, forming a simple groove, results from the re-union of the two bicipital gutters, which are blended between the three eminences just described.

Posterior Region of the Elbow.

The surface of the elbow presents three very distinct osseous projections, which are, externally, the epicondyle; internally, the epitrochlea; and, in the middle, the olecranon; which is, however, a little nearer to the internal than the external tuberosity. When the limb is extended, these eminences are situated nearly upon the same line, but then the olecranon is scarcely prominent. When flexed,

they present a triangle, the apex of which is inferior ; and the olecranon, which then seems to be very much elongated, is below the articulation. The middle prominence is prolonged upwards, under the form of a flattened cord, which is produced by the tendon of the triceps ; and downwards by means of the ulna. In whatsoever position the limb is placed, the internal eminence is equally prolonged, superiorly, by the inner intermuscular ligament, and, inferiorly, by the extensor carpi ulnaris muscle. As the external ascends, it becomes less distinctly marked by the outer border of the humerus. Immediately below it, we may distinguish a transverse groove, which corresponds to the humero-radial articulation ; then the head of the radius, which may easily be felt rotating in its annular ligament. These three projections are separated by two grooves, of which the internal, which is deepest, passes between the olecranon and epitrochlea. This species of gutter insensibly contracts above the joint, by the gradual approximation of the internal portion of the triceps and of the epitrochlo-humeral intersection. It is in this groove that we find the ulnar nerve. The external separates the epicondyle from the olecranon ; it is more superficial and irregular than the preceding. In ascending, it is almost immediately lost behind the tendon of

the triceps. A knowledge of these features is of importance, especially when we wish to establish the diagnosis of fractures and dislocations of this region.

THE FORE-ARM.

The fore-arm, properly so called, is comprised between the regions of the elbow and the circular line drawn half-an-inch above the radio-carpal articulation. Its form is that of an inverted cone, truncated and flattened upon two faces, especially inferiorly. This form varies according to age, embonpoint, and the position of the limb. In children and fat persons, the cone is more regular; in emaciated persons, on the contrary, the fore-arm is very much flattened, and nearly as broad inferiorly as at its superior part. In flexion and pronation, its anterior surface is more convex than in extension and supination.

In the latter position, the fore-arm presents for our consideration a palmar and a dorsal aspect, a radial and an ulnar region.

Anterior, or Palmar Region.

When the limb is in the state of pronation, the inferior part of this region is directed back-

wards, its superior portion inwards. On its surface we observe, superiorly, the continuation of the two muscular eminences of the fold of the arm, and the median groove, which separates them ; in the middle, these two eminences are almost confounded, and the groove is scarcely perceptible. In approximating the wrist, we see, or may feel, from within outwards, the prominence formed by the flexor carpi ulnaris, a groove in which the ulnar artery may be felt ; another prominence formed by the flexor muscles of the fingers ; a third by the tendons of the palmaris longus and flexor carpi radialis, and which is much increased by the flexion of the wrist upon the fore-arm, the fingers being extended—a groove broader and more distinct than the first—which groove may be considered as the termination of that of the superior part, and in which we distinguish the radial artery through the integuments ; finally, a fourth prominence, which is observed on the outer part, and is constituted by the radius. A considerable number of veins also raise the skin, and form a more or less complicated plexus throughout the whole extent of this region.

Posterior Anti-Brachial Region.

This region is more regularly convex than the preceding ; it is more unequal, and its muscles are more distinctly delineated. The principal features which we observe upon its surface are from within outwards :—1st, an elongated prominence, which corresponds to the ulna and the extensor carpi ulnaris muscle ; 2nd, a groove, scarcely distinct superiorly, much broader and more apparent inferiorly ; 3rd, another prominence, formed by the fleshy portion of the extensor digitorum communis ; 4th, a second groove, which separates, superiorly, the latter eminence from that which is formed by the extensor radial muscles, and which turns before and above the extensor muscles and abductor pollicis longus ; 5th, and lastly, a third relief, which corresponds to the latter muscles.

Borders of the Fore-Arm.

The external, or radial border is formed, superiorly, by the external muscular eminence of the fold of the arm, and is consequently found almost entirely in the anterior region. Below this prominence, the radius is subcutaneous ; more inferiorly, we observe the eminence produced by the muscles which pass to the thumb. In

order, therefore, to distinguish fractures of the radius, by following the external surface of this bone we must feel along the external groove of the dorsal aspect of the fore-arm. The internal, or ulnar border, presents, superiorly, the side of the internal muscular eminence, which descends lower than the external ; inferiorly, the ulna is covered by the skin only, so that the superior half of this bone is actually in the posterior region, and that, in order to ascertain its fracture, it is necessary to trace it behind, in the direction of a line which would pass from the internal part of the olecranon to its styloid process ; in the same manner that, with respect to the radius, we would follow another proceeding from the posterior part of the condyle of the humerus to the styloform apophysis of the radius.

THE WRIST.

This part consists of that assemblage of organs which is comprised between the two regions of the fore-arm, and a circular line which would pass below the os pisiforme and upon the root of the thumb ; it consequently includes all the articulations of the bones of the carpus with each other, with the bones of the

fore-arm, and with the hand. Its length is about two inches. It will be divided into two regions by two lines, which continue the anterior border of the radius and the head of the ulna, towards the carpo-metacarpal articulation of the thumb, and the posterior extremity of the fifth metacarpal bone.

Anterior Region.

Its transverse extent is from two to two-and-a-half inches. In examining its surface through the skin, we feel from without inwards,—1st, a prominence formed by the conjoined tendons of the abductor longus and extensor brevis pollicis, a prominence which seems to be continuous above, with the anterior crista and styloid process of the radius ; 2nd, a fossette, which terminates the radial groove of the forearm, and by which we may penetrate into the joint ; 3d, below, and within this fossette, a second eminence, which corresponds to the crests of the scaphoides and trapezium, and which may be readily distinguished when the hand is thrown back. If the thumb and little finger are in contact, and the other fingers extended, whilst the wrist is flexed upon the forearm, an extremely prominent cord will be seen passing upon the preceding relief, this cord is formed by the tendon of the pal-

maris longus. In the state of rest, this tendon and the bones just mentioned gradually subside into the middle prominence of the wrist, which is itself formed by the tendons of all the flexors and of the anterior radial. 4th, a second fossette, which terminates the ulnar groove of the fore-arm, and which corresponds to the artery of the same name. 5th, the eminence represented by the os pisiforme and the tendon of the flexor carpi ulnaris, and behind which we meet with another fossette, surmounted by the head of the ulna ; finally, in the middle, and most inferior part, a superficial excavation, which leads into the palm of the hand.

The Dorsal Region of the Wrist.

Upon its surface we observe, from without inwards, —1st, a fossette, about an inch in breadth, limited above and below by the extremity of the radius and the root of the thumb—anteriorly, by the first eminence of the anterior region, and, externally, by the species of cord which is represented by the extensor longus pollicis—the radial artery crosses the bottom of this fossette, the depth of which is much more apparent when the thumb is in abduction and extension. 2nd, the thumb being in the same position, and the indicator extended

whilst the other fingers are flexed, another excavation of less depth, but broader,—limited, externally, by the tendon of the extensor longus pollicis, and, internally, by that of the extensor indicis,—which excavation is divided by the tendon of the extensor radialis brevis into two triangular portions—one external, containing the head of the second metacarpal bone and the termination of the radial artery, a little more externally; the other, on the contrary, internal, having its base towards the radius, and which will guide us directly into the joint. 3rd, another fossette, which corresponds to the interval of the extensor tendons of the ring and little fingers. 4th, more internally, a small excavation, which is also found between this last tendon and that of the extensor carpi ulnaris; in this is situated the head of the ulna, which sometimes projects considerably. 5th, the depression which separates the tendons of the flexor and extensor carpi ulnaris, as well as the two regions of the wrist internally. These different excavations, circumscribed by as many eminences, permit, on the one hand, pointed instruments to enter into the articulations without dividing the tendons, and, on the other, to synovial tumours and nodi to project under the skin.

THE HAND.

The hand is comprised between the inferior limits of the wrist and the roots of the fingers. It forms an irregular square, and is divided by the acromio-digital and sub-scapulo-digital lines into the anterior, or palmar region, and the posterior, or dorsal region.

Palmar Region.

It is more extensive than the dorsal region, and is prolonged some lines backwards upon the wrist, and forwards upon the articulation of the fingers. Upon its surface we observe,—1st, externally, a muscular prominence, the apex of which terminates at the thumb ; this is the thenar eminence ; 2nd, internally, another eminence, longer but narrower, extending, posteriorly, as far as the os pisiforme, —this is the hypothenar eminence ; 3rd, anteriorly, when the four fingers are approximated, three risings formed by the skin, which correspond to the intervals of the digital roots ; 4th, in the same position, three grooves, which separate these last prominences ; 5th, in the middle, an excavation terminating externally and posteriorly in the indicator, on the one part, and which is continuous with the median groove of the wrist on the other,—

this is the hollow, or palm of the hand ; 6th, in the hollow, several lines are observed which are pretty constant ; one takes its origin from the anterior and external extremity of the palmar gutter, and almost immediately bifurcates in such a manner that the first of its branches makes a semi-circular turn in order to circumscribe the thenar eminence ; whilst the second passes at first transversely, and afterwards forms a semi-lunar curve, in order to terminate upon the posterior part of the hypothenar eminence. Another line seems to originate from the place where the first terminated,—that is to say, from the wrist,—and descends vertically upon the middle of the preceding. Finally, a third extends from the interval which separates the indicator from the medius to the base of the little finger, cutting the hypothenar eminence into two unequal portions. Its convexity looks backwards and outwards, so that, united with the line of the indicator, it somewhat resembles an X with lengthened branches. Each of these three furrows appear to be produced by particular movements ; thus, the first is owing to the movement of opposition of the thumb, and may be called the thumb line ; the second, to the flexion of the other fingers in conjunction with that of the thumb,—when we wish to grasp a cylindrical body, for example,—and

we may name it the indicator line ; the third seems to depend upon the momentary extension of the index finger, whilst the others are flexed upon any body whatsoever,—this is the line of the little finger. By uniting the transverse portion of the last two, we have a furrow crossing the fore part of the hand, about three lines behind the metacarpo-phalangeal articulation, which might be called the metacarpal furrow. These different creases require attention when it becomes necessary to make incisions into the hand.

Dorsal Region.

It is less complicated than the preceding ; and its surface presents, when the fingers are extended and separated,—1st, five cords, which converge towards the wrist, produced by the tension of the extensor tendons ; 2nd, three grooves between these tendons, which increase in breadth as they pass to their termination at the origin of the fingers ; 3d, externally, when the thumb is in adduction,—a prominence which depends upon the first dorsal interosseous muscle, and behind which is observed the excavation of the indicator, which was mentioned when on the dorsal surface of the wrist ; 4th, in the anterior part of this fossette behind the muscular eminence,

when the thumb is in abduction and opposition, we readily feel the posterior extremity of the first two metacarpal bones, separated by a notch several lines in breadth, in the bottom of which we find the radial artery at the instant it is about to penetrate into the palmar region in order to form the deep palmar arch ; 5th, anteriorly, when the hand is shut, the eminences produced by the metacarpal heads, the most prominent of which supports the middle finger.

THE FINGERS.

Placed parallel to one another, conical and more slender in females and children ; cylindrical in most men. All the fingers are far from having the same length ; the medius is the longest of all ; the index and ring fingers usually terminate upon the same line, although, in reality, the indicator is the shortest, because its metacarpal bone is the longest ; the little finger terminates on a level with the last articulation of the ring finger, and the thumb at some lines behind the first phalangeal articulation of the indicator. The phalangeal articulation of the thumb is exactly upon the same line as the metacarpo-phalangeal articulation of the indicator, which is one of the most important circumstances to be noticed,

as it may assist us in our endeavours to penetrate into these articulations.

Palmar Region of the Fingers.

Upon this surface the fingers present a considerable number of furrows, with which it is useful to be well acquainted. There is one only before each of the last phalangeal articulations, and, by incising perpendicularly upon it, we fall about a line behind the joint. There are several, but two in particular, before the middle articulations ; of these, the posterior is the most constant ; it is this which corresponds to the joint, and which would, if incised upon, lead not more than half a line behind it. A similar furrow is observed at the union of the palmar portion of the hand with the fingers ; but this furrow does not bear the same relations to the articulations as the preceding. It is nearly an inch in the anterior region of the hand that the metacarpo-phalangeal union of the fingers is met with. To this, however, the thumb forms an exception ; for, before its corresponding articulation, we may observe a furrow which is disposed as in the middle joints. We would, moreover, be sure to fall upon the metacarpo-phalangeal articulation of the thumb, by prolonging upon its base, when it is in forced

abduction, a line parallel to the direction of the index finger. Between these different furrows we observe some wrinkles, which are occasioned by the plication of the skin, and which are parallel to the direction of the fingers.

Dorsal Region of the Fingers.

This aspect is longer than the anterior ; because, in the latter, the palm of the hand is prolonged, as we have seen, upon the posterior third of the first phalanges. Its surface presents, when the fingers are extended, the termination of the three grooves mentioned when describing the back of the hand ; grooves which, by uniting the 'dorsal and palmar faces, form a thin and concave border, which we may call the commissure of the fingers. Between these grooves, we observe the reliefs produced by the continuation of the extensor tendons. During flexion, there exist three strongly marked angular eminences for each finger, which correspond to the articulations ; but in such a manner, that it is always the anterior phalanx which has glided over the posterior, and the head of the latter alone projects under the skin, a circumstance to be recollected when we amputate. In all positions, but more especially in semi-flexion, there

are many transverse wrinkles observed upon the posterior digital surface, scarcely perceptible upon the bodies of the phalanges, but always very distinct in the immediate neighbourhood of the joints. There are generally three of these furrows upon each articulation; one before, another behind, and the third in the middle. The last is generally the deepest; and it is about two lines before it that the incision must be made, if we cannot discover the anterior, in order to penetrate into the joint. It is necessary to note, however, that this disposition does not exist with respect to the metacarpo-phalangeal articulation.

THE CHEST.

The chest forms the middle cavity of the body, and is continuous, superiorly, with the neck,—inferiorly, with the abdomen; and serves as a point of attachment to the superior extremities.

The figure of its skeleton is that of a truncated cone with an inferior base.

When it is surrounded by its soft parts, on the contrary, its superior part is broadest. In this direction, it appears as if flattened, and its transverse diameter from shoulder to shoulder, is greater than its antero-posterior.

This form presents gradations infinitely varied, according to age, sex, and individuals.

Anterior, or Sternal Region.

It is bounded, superiorly, by the infra-hyoideal and supra-clavicular regions ; inferiorly, by a curved line, which unites the epigastrium to the chest ; and, laterally, by the two clavi-coxal lines which separate it from the axillary region above, and from the costal region, properly so called, below. The surface of this region presents, in the middle and from above downwards, the supra-sternal notch, much deeper in emaciated than fat persons ; a depression, which corresponds to the os primisternal (Beclard) ; an eminence, which does not always exist, and which depends upon the more or less angular junction of the primi et duo-sternales ; a second depression, more constant than the first, of which it is sometimes the continuation, and which generally increases in depth in proportion as it approximates the fore part of the xiphoid appendix, upon which we almost always observe an excavation, and the point of which occasionally forms a relief under the skin ; upon the sides, the prominences produced by the heads of the clavicles below, in thin individuals ; a series of hollows and risings, which are in relation with the intercostal spaces and the cartilages which circumscribe them. In fat persons, on the contrary, we remark a prominence elon-

conformation of the thorax. In the inferior part of the region, the median ridge is pretty frequently very prominent ; the lateral grooves are also much deeper, and the muscular eminences larger than in the superior portion. This difference arises from the spine being very convex above ; whilst below it is inclined in the opposite direction, from the spinous process being very oblique superiorly, and horizontal inferiorly. As the lateral convexities depend as much upon the curvature of the ribs as upon the prominence formed by the muscles, we shall always increase them by carrying the arm forwards, so as to cross them upon the fore part of the chest, or over the head, for example ; which it is necessary to do when we endeavour to ascertain the state of the lungs, or of the other thoracic viscera, by percussion or auscultation.

Costal Region.

The lateral region of the thorax is double, and may be divided into two portions on each side ; one superior, which enters into the axillary region, and which has already been examined ; the other, inferior or sub-axillary, which forms the costal region, properly so called. The costal region is bounded, supe-

riorly, by a line drawn from the inferior angle of the scapula, along the hollow of the axilla, below the nipples; inferiorly, by another line, carried along the margin of the costal cartilages, and thus uniting the two scapulo-coxal and clavi-coxal lines; anteriorly, by the sternal region; and, posteriorly, by the dorsal. Upon its surface, we observe, above the prolongation of the two borders of the axilla, and, in their interval, the great excavation which forms the commencement of the cavity of this region. The first prominence supports, anteriorly, a portion of the mammary gland, below which we see a depression which we would call, with M. Gerdy, the sub-mammary depression; the other descends obliquely backwards, and may be distinguished even as far as the last ribs. In strong muscular subjects, we notice, between the two preceding prominences, some digital impressions, which indicate the origins of the *sarratus anticus*.

Finally, we perceive by the touch, unless the subjects are very fat, the ribs, intercostal spaces, and the summits of the twelfth and eleventh ribs—when they are free in the muscular parietes.

Mammary Region.

It is formed by the *mammæ*, and cannot have any exact limits. In man, it scarcely exists, and

does not merit any special consideration ; in the female, on the contrary, it is an important region—but after puberty only ; previous to this epoch, the breast is only rudimental, as it always is in the opposite sex. The volume, form, and density of this organ vary according to the age of the mature female, her state, constitution, &c. Thus, the *mammæ* represents two half spheres, regularly rounded and firm, upon the fore part of the chest of young virgins, soft, pendant, and more or less flattened in women who have had children. Sometimes they form a considerable relief, at others we scarcely distinguish them ; and this may depend upon their intrinsic volume, or the abundance of the cellular tissue which surrounds them. If, on the one hand, the well-formed breasts concur in setting off the graces and elegance of the sex, if their functions render their preservation of the highest importance—on the other hand, they sometimes embarrass the surgeon considerably when it becomes necessary to apply an apparatus upon the thorax. For example, the bandage of Desault in fractures of the clavicle ; those which are used for fractures of the ribs ; in short, all compressive bandages which we are obliged to apply around the thorax of females, require considerable precaution on account of the *mammæ*. These organs also prevent our

deriving such satisfactory results in this point from percussion and auscultation, whether mediate or immediate, as in men.

ABDOMEN.

By the term abdomen, we mean that large part of the trunk, which is bounded, superiorly, by the thorax—inferiorly, by the pelvis—and, posteriorly, by the lumbar portion of the spine, which is also comprised in it. In the adult, its surface presents greater breadth below than above, especially in females; which is owing to the enlarged capacity of their pelvis, and the compression of the thorax by dress. In the fœtus, and in childhood, we observe an inverse disposition; that is to say, that then, in consequence of the narrowness of the pelvis, the shortness of the sternum, and the elevation of the ribs, the abdomen appears to be much broader superiorly.

Thoraco-epigastric Region.

This portion of the abdomen comprises the epigastric and hypochondriac regions. Its vertical dimensions are much more extensive before than behind, because the circle which bounds it below, in its course along the inferior margin of the last rib, approximates the supra-epigastric line considerably.

Epigastric Region.

This region is circumscribed by the clavi-coxal, supra-epigastric, and sub-umbilical lines, so that it includes a portion of the hypochondria, and, strictly speaking, it should be limited upon the sides by the margin of the costal cartilages, as represented in *Plate III*. Thus considered, it represents a triangle, with its base downwards. Upon its surface, and in the middle, we observe the scrobiculus cordis, surmounted by a relievø corresponding to the cartilage of the sternum, and, upon the sides the border of a species of arch formed by the anterior notch of the thorax.

The recti muscles are seldom so prominent here as to be distinguished externally.

In dropping a line from the base of the xiphoid appendix upon the middle of the supra-umbilical line, we find about five inches-and-a-half ; if we carry this same line to the point of intersection of the clavi-coxal and supra-umbilical lines, we shall have from six to six-and-a-half inches.

Hypochondriac Regions.

These regions are bounded, anteriorly, by the clavi-coxal lines ; posteriorly, by the dorsal region ; superiorly, by the epigastric line,

and inferiorly, by the supra-umbilical circle ; or, rather, they comprehend that portion of the thorax which corresponds with a portion of the bodies of the five false, and the last true ribs : or, in other words, they are circumscribed, inferiorly, by the curved line, which commences at the ensiforme cartilage, and is continued along the inferior margin of the chest as far as the eleventh dorsal vertebra, and, superiorly, by the line just mentioned, so that they enter entirely into the dorsal, sternal, and especially the costal regions.

MESOGASTRIC ZONE.

This is limited by the supra and sub-umbilical lines, and is the most regular of all. It presents us with four regions exactly limited ; an anterior, a posterior, and two lateral regions.

The Umbilical, or middle Region of the Abdomen.

This region forms an almost exact square, having the umbilicus nearly in its middle, or rather more approximated to the epigastric than the hypogastric region, and is included between the two clavi-coxal, the supra, and the sub-umbilical lines. In infants, and some very thin adults, the umbilicus is prominent, be-

coming more and more depressed according to the degree of obesity and the advancement of age. It is a species of centre, about five inches distant from the anterior iliac spinous processes, six from the apex of the twelfth rib, five-and-a-half from the eleventh, five from the tenth and eighth, and four-inches-and-three-quarters from the ninth. The dimensions of this region are about nine inches, inferiorly, and from seven to eight only superiorly.

Region of the Flanks, or of the Sides of the Abdomen.

This region is much less extensive than the preceding, and is bounded, superiorly, by the margin of the thorax, or supra-umbilical line; inferiorly, by the crista of the ilium; anteriorly, by the clavi-coxal line, or the umbilical region; and, posteriorly, by the sacro-spinal muscular mass, or the scapulo-coxal line. Upon its surface, we observe in fat persons, women especially, a kind of bulging inferiorly, which is sometimes very large; otherwise, it is more or less excavated, prolonging the lateral depressions of the abdomen, and producing a hollow which interferes with the exact application of bandages, when it becomes necessary to give them a certain breadth.

Lumbar Region.

This region is bounded, superiorly, by the dorsal portion of the thorax ; inferiorly, by the posterior part of the hypogastric circle; and, laterally, by the scapulo-coxal lines.

It is longer in its middle than lateral portions, on account of the approximation of the crest of the ilium to the last ribs. In the vertical position, it presents a concavity which is scarcely evident in children, but very distinct in females, especially in those who have contracted the habit of forcibly drawing the pelvis backwards in order to render the chest more prominent. It is also considerably increased in women who approximate the termination of pregnancy, and at all times that we carry the axis of the body backwards for the purpose of sustaining a heavy burden. When we lie on the back, or bend the body forwards, this concavity disappears.

As these variations in the curvature of the lumbar region alter the relative directions of the axis of the trunk and pelvis, they consequently have a greater influence over the process of labour and the formation of herniæ.

Upon the median line, we observe a longitudinal groove, which increases in depth in proportion as it approximates the sacrum, in the middle of which we may readily feel the ridge

formed by the spines of the vertebræ. This groove, which is the continuation of that of the back, is more evident in the erect posture, and in fat or muscular subjects; then the ridge appears much deeper. In childhood, old age, emaciated persons, and when the body is inclined forwards, the groove scarcely exists, and the vertebral processes are quite prominent.

On each side of this gutter we observe an eminence, which is also proportionate to the embonpoint of the subject and the volume of the sacro-spinal muscle, and susceptible of the same variations as the median groove in the different attitudes, &c. Superiorly and externally, near the flank, we distinctly feel the twelfth rib, and, inferiorly, the posterior prominence of the iliac crest.

HYPOGASTRIC, OR INFERIOR ZONE OF THE ABDOMEN.

This zone does not admit of the same division as the preceding. Its posterior half will be sub-divided into the region of the haunches, or glutæal, and into the sacral region. Its anterior half is bounded, inferiorly, by a semi-circular line, commencing at the anterior superior spinous process of the ilium, following the course of Poupart's ligament, passing upon the symphysis pubis, and terminating

at the same point on the opposite side. The middle part of this portion will retain the name of hypogastric region, and the sides will be called iliac regions.

Hypogastric Region, or Hypogastrium.

This region is bounded, laterally, by two lines drawn slightly oblique from the hypogastric circle, along the external margin of the rectus muscle upon the body of the pubis, immediately on the outer side of its spine; superiorly, by the umbilical region; and, inferiorly, by the symphysis and body of the pubis.

Upon its surface, and in fat persons, we observe a transverse furrow above the mons veneris, or pecten, with which it is continuous inferiorly. Upon the median line, the gutter indicated in the superior regions of the abdomen no longer exists. In pregnant women, the hypogastrium is at first the only point of the belly which distends, rises, and is thrown forwards; and we frequently observe, in those who have had several children, a fold of greater or less thickness, which inclines upon the fore-part of the mons veneris.

Iliac Regions.

The iliac regions are almost triangular in their form, and are situated on each side of the hy-

Ano-Perineal Region.

This region is bounded, anteriorly, by the root of the scrotum ; posteriorly, by the apex of the coccyx ; and, laterally, by the tuberosities of the ischia. It is of an oval form, its largest extremity situated posteriorly, and comprises all those parts which are included in the circle of the inferior strait of the pelvis. Its surface presents, anteriorly, and upon the median line, an elongated prominence which corresponds to the canal of the urethra, in the middle of which is the raphe. Behind this prominence the opening of the rectum, and, more posteriorly, the coccygeal eminence. Upon the sides of the urethral prominence we find two deep furrows, bounded, externally, by the inner and posterior part of the thigh and buttock, in the bottom of which it is always possible to feel the ascending ramus of the ischium, and the descending of the pubis. As to the anus, it is found at the bottom of an excavation limited by the buttocks and the ischiatic tuberosities. If we draw a line transversely from one tuber ischii to the other, we separate what is properly called the perineal region from the anal region, and thereby constitute an anterior triangle, the base of which is formed by this line, whilst its apex corresponds to the superior part of the

arch of the pubis. As the sides of this triangle are slightly convex, it follows that its apex appears narrow and elongated. Their length is about three-inches-and-a-half, whilst the base is usually only three inches. If we drop another line from the summit of this space to the fore part of the anus, we shall equally find three inches. The perinæum then presents two triangles, which are perfectly similar, and it is by one of these triangles that the instrument must necessarily penetrate in order to arrive at the bladder, in the lateralized operation of lithotomy. In order to distinguish these different features, the thighs must be widely separated and flexed upon the pelvis; for, otherwise, there only exists between the thighs a simple groove, in the bottom of which is found the anal aperture, the root of the scrotum, and of the penis; so that in the foetus — during labour, for example — this groove is transformed into a fissure, so narrow by the pressure which the breech experiences in passing through the superior strait, that many accoucheurs have been deceived by it, mistaking it for the sagittal suture.

Sacro-coccygeal Region.

This region is a continuation of that of the loins, and terminates the posterior part of the trunk: like the bones from which its name is derived it is triangular, and is bounded, superiorly, by the posterior sixth of the hypogastric line; laterally, by the eminence which the iliac crests form behind; inferiorly, it terminates at the apex of the coccyx. Above, it is concave transversely; below, convex. In the excavation, and upon the median line, we feel the spinous process of the sacrum, and the posterior surface of its appendix. Its lateral portions terminate, inferiorly, by a double notch, which leads into the anal region, and which are limited, in the middle, by the coccyx, at the sides, by the projection of the glutæi muscles. It is in the bottom of the superior excavation that we apply one extremity of the pelvimeter, whilst the other is placed upon the fore part of the pubes, in order to ascertain the dimensions of the sacro-pubic diameter, which we may suspect to be very narrow when this concavity is very deep, as we observe, especially in those females who have contracted the habit of throwing the head and pelvis backwards, in order to render the chest prominent. Then the total curvature of the region is more or less augmented, and its convexity

more developed. Therefore, as this disposition necessarily coincides with a deeper concavity of the posterior wall of the cavity of the pelvis, and consequently, with more or less diminution of the sacro and coccy-pubic diameters, it is necessary to examine it attentively in females, when we wish to ascertain whether their pelvis is well or ill formed.

Glutæal Region, or the Haunch.

This region comprises all those parts which rest upon the lateral portion of the pelvis. It is bounded, posteriorly, by the sacro-coccygeal region; anteriorly, by a line which would fall from the anterior and superior spinous process of the ilium upon the trochanter major; superiorly, by the contour of the iliac crest; and, inferiorly, by another line drawn from the great trochanter to the ischion, and from thence towards the apex of the coccyx. The surface of this region, therefore, presents a considerable number of osseous eminences, which may be felt under the skin; in short, it is rounded and very protuberant.

PELVIC EXTREMITIES.

The inferior extremities, in like manner with the superior, pretty naturally divide themselves into six portions, namely, 1st, a superior portion, which

corresponds to the shoulder ; 2d, the thigh ; 3d, the knee ; 4th, the leg ; 5th, the tibio-tarsal articulation ; and 6th, the foot.

Inguinal Region, or Anterior and Superior Portion of the Thigh.

The limits of the inguinal region are not so exactly defined that all anatomists are agreed upon this point ; some comprise under this name merely that groove which separates the anterior parts of the abdomen and of the thigh ; others—and these the most numerous—thus call the triangular space which is circumscribed by Poupart's ligament, the sartorius and adductor longus muscles. The inguinal region, in its greatest possible extent, will be limited, superiorly, by an oblique and slightly convex line, which would extend from the anterior and superior spinous process of the ilium to the outer side of the spine of the pubis ; inferiorly, by a transverse, or semi-circular line, the extremities of which would fall upon the tuberosity of the ischium, and two inches below the great trochanter ; externally, by the glutæal region ; and, internally, by the pubic region above and the perineal below. Upon its surface, in a thin but muscular man, we observe, when the limb is extended,—1st, above the ligament which forms the superior boundary ;

2nd, below, a fold which passes from the anterior spine of the ilium below the ischium, in order to become continuous with the glutæal, or sub-ischiatic groove. It is in this fold that crural herniæ manifest themselves ; as it depends upon the movements of the thigh upon the belly, its depth is considerably increased during the flexion of this extremity ; 3rd, from without inwards, a vertical eminence which points out the position of the tensor vaginæ femoris muscle ; 4th, a second prominence, oblique inwards, produced by the sartorius ; between these two eminences, there is a triangular depression, with inferior base, of greater or less depth, in the bottom of which the rectus femoris muscle sometimes projects ; 5th, a third prominence, more distinct than the preceding, oblique outwards and from above downwards, and which corresponds to the gracilis and adductor longus muscles ; 6th, finally, between the latter and that of the sartorius, a triangular excavation, with superior base, which constitutes the inguinal hollow.

THIGH.

This part of the limb is bounded, superiorly, by the inguinal region before, and by the ischiatic region behind ; inferiorly, by a circular line, which we

shall place at four fingers' breadth above the condyles of the os femoris. It is slightly flattened upon its anterior and internal, posterior and external surfaces, when the limb is in the semi-flexed position, so that the axis of its greatest thickness would be oblique from before backwards, and from without inwards. When extended, on the contrary, it is rounded and conoidal, whence it follows, that in order to apply a roller bandage, for example, smoothly around the thigh, we are obliged to reflect it at every turn. It is in females especially, that this conical form is very evident; in the adult man, the thigh is more or less protuberant forwards and outwards. In strong muscular men, we observe upon it a series of eminences and depressions, which correspond to the muscles and their intervals; but these entirely disappear in women.

The thigh we divide into anterior and posterior regions, separated from each other by two lines, one of which is dropped from the trochanter major; the other from the ischio-pubic ramus, upon the extremities of the transverse diameter of the circle which circumscribes them below.

Anterior Femoral Region.

This region is generally convex, but its surface presents nothing remarkable, except a species of superficial gutter which traverses it very obliquely from above downwards, and from

without inwards ; a gutter, moreover, which seems to be a continuation of the inguinal hollow, and the direction of which is nearly parallel to that of the artery.

Posterior Femoral Region.

We are obliged to prolong it a little more towards the pelvis than the preceding, on account of the fold of the buttock, or the sub-ischiatic groove. Its surface is in general regularly rounded, unless it is inferiorly, where it presents the origin of several prominences and depressions which are found in the popliteal region.

THE KNEE.

The figure of the knee is very irregular and indeterminate. It is bounded, superiorly, by a circular line which forms the inferior limit of the thigh, and is separated from the leg by another circular line placed at four fingers' breadth below the patella. The two sub-pubic and coxo-malleolar lines will divide it into anterior and posterior regions.

Anterior Region, or Region of the Knee.

Its surface presents, in the middle, a very striking projection, which is more prominent when the limb is semi-flexed than in complete extension and flexion. This eminence is triangular, having its apex turned downwards, and corresponds to the patella. Above this, the limb being extended and the muscles quiescent, we find a transverse groove, upon which we apply one of the graduated compresses for the purpose of retaining the two fragments in contact in transverse fractures of the patella. Below it another notch, which corresponds to the fore part of the articulation, and upon which we place the other compress in the accidents just mentioned.

When the muscles are thrown into action during semi-flexion, each of these notches is divided into two fossettes, one by the tension of the ligamentum patellæ, the other by that of the tendon of the rectus femoris muscle. Below the inferior we feel a fixed prominence, which is formed by the tubercle of the tibia, and is continuous with the spine of this bone. Upon the inner side of the patella, we see a groove which is parallel to the axis of the limb, and is continuous above and below with the internal fossettes of the two preceding notches. We may remark, that if an instrument is in-

troducted at one of these points, it will penetrate directly into the joint, or rather into the synovial membrane ; and that there we most easily distinguish the fluctuation in hydrops articuli. More posteriorly, we observe the prominence produced by the internal condyle of the os femoris, which prominence may be divided into two others ; an anterior, which bounds the preceding groove ; and a posterior, which forms a part of the inner margin of the ham (popliteal space). Below these two tuberosities we feel a narrow and transverse groove, which leads directly into the inter-articular line ; then, a little lower down, the internal condyle of the tibia, which is continuous with the internal border of this bone ; superiorly, this internal prominence is prolonged by a species of cord, which we readily perceive when the limb is semi-flexed, and which corresponds to the tendon of the adductor magnus. Anterior to this cord, we observe the relief formed by the termination of the vastus internus muscle. On the outer side of the patella there is also a groove, as on the inner side, which is only perceivable during extension. This groove is lost in the two external fossettes of the notches first indicated, and of which the superior corresponds to the interval, which separates the tendinous termination of the vastus externus

rates the tendons of the gracilis and semitendinosus ; and we see that this margin is continued very far upon the internal part of the posterior femoral region. It is proper to note, that when the ham-strings are put on the stretch, they are about two inches in breadth, the inner one even a little more ; whilst, when the limb is extended, they almost entirely disappear, or are very nearly on a level with the posterior face of the femur ; whence it follows, that in the first case they might be divided transversely, by a cutting instrument directed upon their free border, without the artery being involved in the wound ; and that, in the second, on the contrary, the vessel would be wounded before it reaches the ham-strings ; in this position also, a ball or sword might penetrate these borders from the inner to the outer side ; for example, in such a manner as to pass freely behind the femur, and even behind the popliteal artery, which, however, would then be in great danger of injury ; whilst, if the leg is extended, these vulnerant bodies would inevitably strike against the os femoris, which would not fail to stop them.

THE LEG.

The leg is comprised between the circle which forms the inferior boundary of the knee, and a second circular line placed above the malleoli. Its form is that of an irregular cone, with its largest extremity turned upwards. Upon its surface we observe, anteriorly, upon the median line, a crest, which extends from the tibial tuberosity to the lower part of the region, becoming rounder as it descends; this is the crest of the tibia. On the outer side of this crest, we see an inclined plane which corresponds to the muscles of the anterior and external region of the leg; posteriorly, a considerable prominence, broad and very convex superiorly, where it constitutes the calf, becoming gradually narrower as it descends, so as to form a species of cord, which represents the tendo achillis: in a state of contraction, the calf, properly called, is separated into two portions by a double groove, which corresponds to the point of separation of the gemelli and soleus muscles. Externally, the posterior prominence is blended with the anterior plane; but, as it descends, it becomes separated from it by a groove, which is at first quite superficial, but at the lower part is of considerable depth. This groove corresponds to the interval which exists between the soleus and lateral peronei muscles, then between the tendo achillis and fibula; so that anterior to this groove, this bone may be felt

naked under the skin. On the inner side there is another gutter, which separates the calf and tendo achillis from the tibia throughout the whole length of the leg, but in such a manner, that, superiorly, this groove falls upon a cellulo-adipose space, which is limited anteriorly, by the internal border of the tibia and the tendon of the gracilis above, and posteriorly, by the gemellus internus; so that this is the proper place for the application of caustic, or the introduction of setons. In order that these objects may be properly examined, it is necessary to divide the leg into three regions—one, anterior and internal—another, external and anterior—and a third, posterior. The latter is separated from the two others, by the continuation of the coxo and pubio-malleolar lines; and the internal is separated from the external, by the crest of the tibia.

Anterior and External Region.

It comprises all the soft parts resting upon the anterior fossa, which is circumscribed by the bones of the leg. Broader superiorly, and especially in the middle, where it is convex, than inferiorly, where it is rounded and blended with the internal aspect, this region presents during extension only, different prominences and divers depressions, occasioned only by the contraction of the muscles.

Posterior Region of the Leg.

This region is limited externally by the preceding ; internally, by the inner border of the tibia ; and is much broader than that which has just been studied ;—it comprises all the soft parts which exist behind the bones of the leg ; includes the double prominence of the calf, that of the tendo achilles, and the two tibio and peroneo-calcien grooves. It is usually more uneven and dry in man than in woman ; which is owing to the greater predominance of the cellular tissue in the latter sex.

Internal or Tibial Region of the Leg.

This region is formed by the parts which lie upon the internal face of the tibia ; is convex, like this bone, and pretty distinct superiorly ; inferiorly, on the contrary, it is lost, so to say, in the anterior and posterior regions.

THE MALLEOLI.

This portion of the inferior extremity will also comprise the instep, and the inferior part of the tendo-achillis. It presents, internally and externally, the two malleolar eminences ; behind which we observe the termination of the tibio, and peroneo-calcien gutters ; transversely upon the instep,

properly so called, we discover by the touch, from within outwards : 1st, a depression which separates the internal malleolus from the tendon of the tibialis anticus muscle ; 2nd, the prominence produced by this tendon ; 3rd, a second depression, which separates it from the tendon of the extensor proprius pollicis pedis ; and 4th, another prominence, corresponding to the extensor longus digitorum.

Internal Malleolar Region.

Upon the surface of this region we observe the eminence which gives to it its name, and a small excavation below and before the point of this eminence, which separates the tendon of the tibialis posticus muscle from that of the tibialis anticus. In proceeding from the posterior border of the malleolus to the internal part of the heel, we feel, at about six or eight lines from the first of these two eminences, a small relief, which is only worthy of notice, but inasmuch as it corresponds to the posterior insertion of the fibrous sheath which separates the flexor tendons of the toes from the other soft parts.

External Malleolar Region.

Anteriorly, it is separated from the dorsum of the foot by an excavation, which is generally very

deep, and which corresponds to the astragalo-calcien excavation ; inferiorly and posteriorly, it is separated from the heel by the termination of the peroneo-calcien gutter, and by which we might easily penetrate into the articulation : finally, between these two depressions and below the malleolus, we perceive a relief formed, at first, by the peroneus longus and peroneus tertius tendons, afterwards by the tuberosity which exists upon the external surface of the os calcis.

*Anterior Inter-Malleolar Region, or Region
of the Instep.*

This part is comprised between the two malleoli, the head of the astragalus, and the anterior region of the leg ; and presents, exteriorly, from within outwards : 1st, the eminence formed by the tibialis anticus tendon ; 2d, the triangular depression which separates this tendon from that of the extensor longus pollicis ; 3d, another triangular depression, broader but more superficial, the base of which includes the head of the astragalus ; 4th, lastly, the relieve formed by the tendinous bundle of the extensor digitorum longus and peroneus tertius. Internally and externally, these objects are separated from the

malleoli by the two excavations which limit these two eminences on each side.

*Posterior Inter-Malleolar Region, or Region
of the Tendo Achillis.*

This region only presents the termination of the tendo achillis, because the heel, which it would seem to comprise below, necessarily appertains to the foot. We may say, however, that it includes all the parts which rest upon the posterior notch of the os calcis, as well as upon the posterior surface of the tibio-tarsal articulation, always with the exception of those which have been examined in the preceding region.

Upon its surface we observe the broadest portion of the peroneo and tibio-calcien gutters, which separate it from the malleoli. The tendo achillis forms a perfectly insulated cord, which is very remote from the articulation of the leg.

The greater the degree of separation, the longer is the arm of power of the lever which the foot represents; and, consequently, the greater the firmness in standing and the facility of progression.

It also follows from this disposition, that a sword, or any similar weapon, might easily traverse the leg from one side to the other before the tendo achillis, without wounding this cord, or

touching the vessels, tendons, or deep-seated muscles.

THE FOOT.

This part, which resembles the hand in many respects, is disposed in such a manner, that its inferior surface bears horizontally upon the ground in the vertical position, and that its superior surface receives the weight of the body, towards the union of the three anterior fourths with its posterior fourth. It is of a triangular form, the base of the triangle represented by the toes, and the apex by the heel.

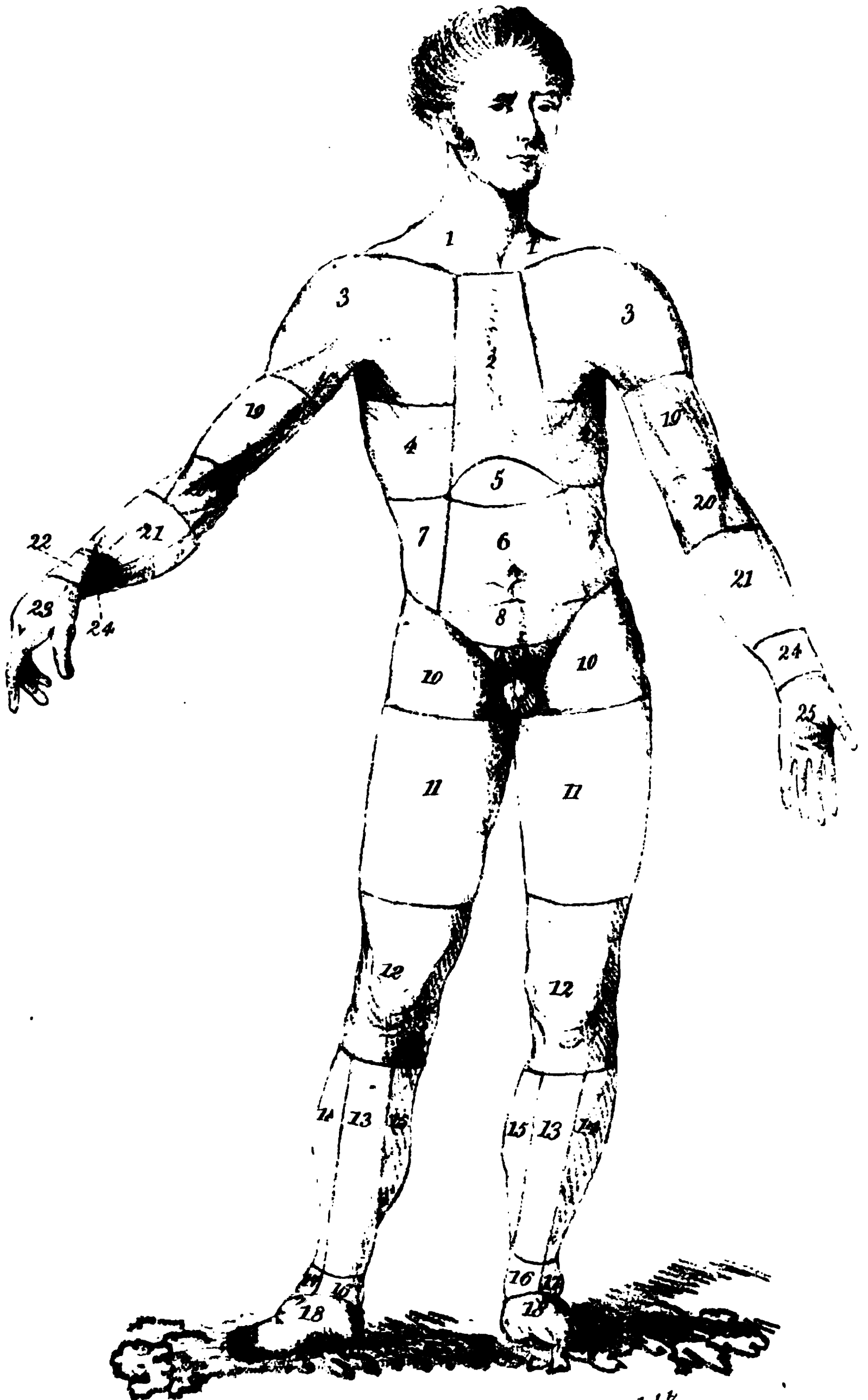
Dorsal, or Superior Region.

Bounded by the instep behind and by the junction of the toes before, this region does not, as we perceive, comprise the whole extent of the superior surface of the foot, because the articulation of the leg occupies a pretty considerable part of it. Internally and posteriorly, it is more or less convex, becoming gradually flattened, and seeming to expand anteriorly and externally. Posteriorly, we observe a relief which is quite distinct in certain persons, and which corresponds to the fleshy portion of the flexor brevis digitorum muscle. In passing towards the internal border, we

observe the continuation of those different eminences and depressions which were noticed when speaking of the instep. Anteriorly, we feel through the skin, especially in emaciated persons and when the toes are extended, the tendons which appertain to them and their intermediate grooves.

The Planter, or Inferior Region.

As the sole of the foot is not divided by the leg, it is of much greater length than the dorsal region; on the one hand, it is prolonged backwards to the posterior extremity of the heel; on the other, it advances almost an inch under the toes. The surface of this region is prominent before, behind, and in its external half; in the middle and internally, it presents an excavation of greater or less depth, into which the peronæo-calcaneal gutter falls, and which repeats, in part, the palm of the hand.



W. Cocks del.

PLATE 3.

Anterior Regions of the Body.

1. Supra-clavicular.
2. Sternal.
3. Sub-clavicular.
4. Costal.
5. Epigastric.
6. Umbilical.
7. Flank.
8. Hypogastric.
9. Pubic.
10. Inguinal.
11. Anterior crural.
12. Knee.
13. Anterior region of the leg.
14. External tibial.
15. Posterior region of the leg.
16. Internal malleolar.
17. External malleolar.
18. Dorsal region of the foot.
19. Anterior brachial.
20. Fold of the arm.
21. Anterior anti-brachial.
22. Posterior region of the wrist.
23. Dorsal region of the hand.
24. Anterior region of the wrist.
25. Palmer region.

PLATE 4.

Posterior Regions of the Body.

1. Posterior region of the neck.
2. Posterior region of the shoulder.
3. Posterior brachial.
4. Elbow.
5. Posterior anti-brachial.
6. Anterior region of the wrist.
7. Posterior region of the wrist.
8. Dorsal region of the hand.
9. Costal.
10. Flank.
11. Dorsal region of the thorax.
12. Lumbar.
13. Gluteal.
14. Posterior crural.
15. Popliteal.
16. Posterior region of the leg.
17. Internal malleolar.
18. External malleolar.
19. Dorsal region of the foot.

Plate 4

6

W. Cocks del.

Plate A 2.



a



W. C. C. C.

PLATE A. 2.

Circular Amputation of the Arm.

- a.* The integuments.
- b.* The muscles.
- c.* Os humeri.
- d.* Vessels and nerves.

Operation.—The patient is generally seated on a chair, with the arm in the extended position, and supported by an assistant, who can also compress the artery in the middle of the arm, or the tourniquet may be used for that purpose. The skin being retracted, and the operator, standing on the outer side of the limb, carries his hand under it, armed with the middle size amputating knife, and makes a circular incision through the skin to the muscles; the integuments are then to be retracted, but not dissected from the subjacent parts, as a few touches of the knife are sufficient to divide whatever slips of cellular membrane that connect them to the muscles.

See pages 88, 89.

At the place where the skin has been reflected to, the surgeon again applies the knife, commencing external to the biceps muscle, and divides the muscles and vessels, cutting them obliquely upwards. He will find it necessary to make a second incision close to the retracted muscles, to divide the remaining soft parts to the bone ; after which he detaches from it the muscles for the space of an inch or an inch and a half, or in proportion to the size of the limb : he then protects the soft parts by a retractor, and saws the bone. The vessels next demand his attention,—the principal one will be found internal and a little anterior to the humerus, and one or two to the external side of the stump.

Plate A.



W^o Cocks

PLATE A. 2. *a*.

Circular Amputation of the Fore-Arm.

- a. a.*** Integuments of the arm.
- b. b. b.*** Muscles of the fore-arm.
- c.*** Radial artery.
- d.*** Ulnar artery
- e.*** Radius.
- f.*** Ulna.

See page 89.

PLATE A. 2. *b.*

Amputation of the Fore-Arm with the Double Flap.

- a. a.* Integuments of the two flaps.
- b.* External flap.
- c.* Internal flap.
- d.* Radius.
- e.* Ulna.
- f.* Ulnar artery.
- g.* Radial artery.

Operation.—The tourniquet is applied on the humeral artery, whilst an assistant holds the fore-arm in a middle state, between pronation and supination.

The operator placed to the inside of the limb, as in all cases of amputation of the fore-arm, takes hold of the part which is to be removed with his left hand; he thrusts the point of the knife between the bones, from below upwards, through the soft parts, beginning on the inner and anterior side of the ulna, and passes it out at the corresponding point of the

See page 90.

Plate A. 2. b.

2.3

9

f

W. C. C. K. 6

outer and anterior side of the radius, denuding the bones: then he forms a flap, an inch or two in length, by cutting towards the palm of the hand. He then passes the instrument under the integuments, behind the bones, from the point where it came out before the radius, to that on the inner edge of the ulna, where it was first introduced, and forms a flap posteriorly of the same length as the former.

These being held back by an assistant, the operator introduces the point of his knife between the bones, from the anterior side; divides the muscular fibres and interosseous ligament, and draws it out by cutting round the ulna.

He again passes it between the bones from the posterior surface, and withdraws it in a similar manner, by cutting round the radius. By this figure of 8 incision he completely denudes the bones by dividing the muscles, tendons, interosseous ligament, and the periosteum.

Then taking a retractor he passes the middle end between the bones from before and presses it on the posterior flap; he then crosses the two lateral ends of the retractor: the undivided end serves to raise the anterior flap; the assistant draws tight the retractor; the operator then takes a saw in his right hand, and with the left thumb marks the point at which the bones are to be sawn through, the arm being pronated.

Four arteries generally require ligatures,—the radial, ulnar, and the two interosseal.

PLATE A. 3.

Amputation of the Fingers at the First and Second Phalanges.

Fig. 1.

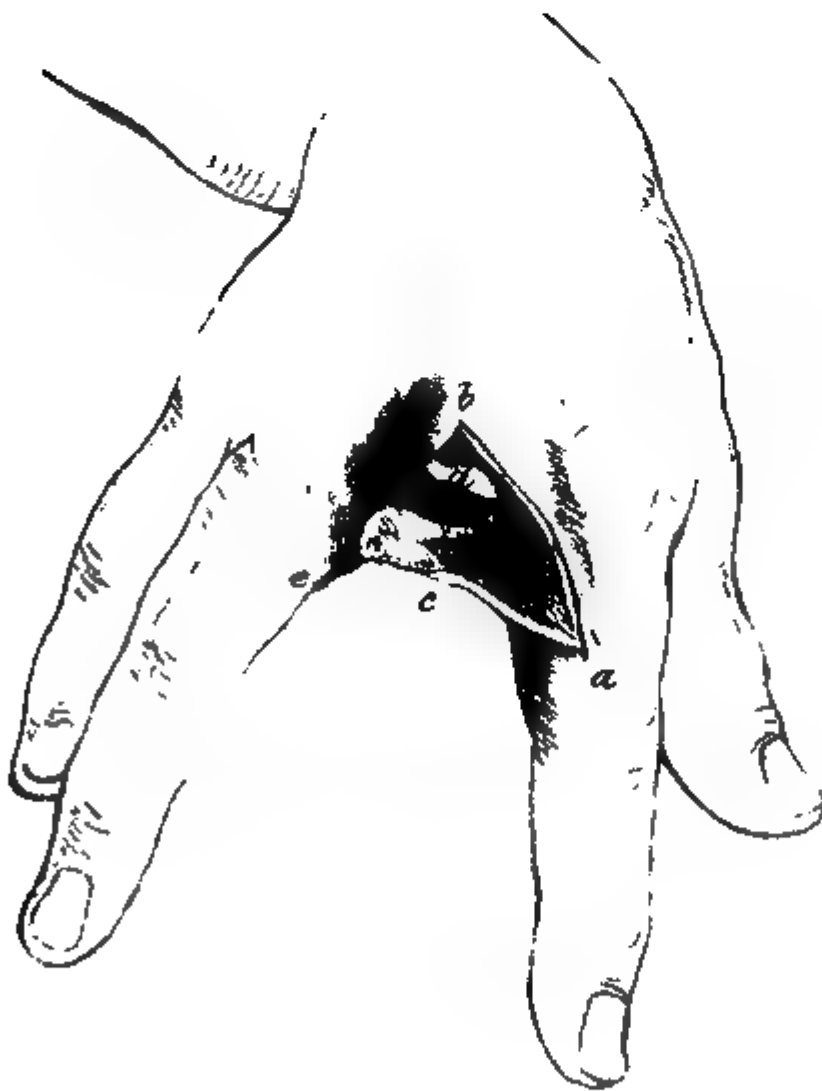
- a.* The articulating surface of the superior phalanx of the fore finger.
- b. to c.* Extent of circular incision on the back part of the finger.
- d.* The flap formed by the integuments at the palmar surface of the finger.

Fig. 2.

In this operation the knife is carried from *e.* to *b. c.*, or from *b.* to *e. c.*; the joint is disarticulated at *d.*, and the operation completed by forming the flap *a. b. c.*

See pages 104 to 106.

Fig.1



W^P Cocks

PLATE A. 3. b.

Amputation of the Little Finger.

Fig. 1.

- a.*** Extent of the incision.
- b.*** Integuments.
- c.*** Muscular substance.
- d.*** Os unciforme exposed.
- e.*** Flap thrown back.

Fig. 2.

Amputation of the wrist at the radio-cubito-carpal articulation.

- a.*** The carpal extremity of the ulna.
- b.*** The carpal extremity of the radius.
- c. to d.*** Extent of the circular incision on the dorsal part of the wrist.
- e.*** The flap formed by the integuments, muscles, and tendons of the palmar portion of the hand.

See pages 104 to 106.

Fig 1.

Plate A 3.6.

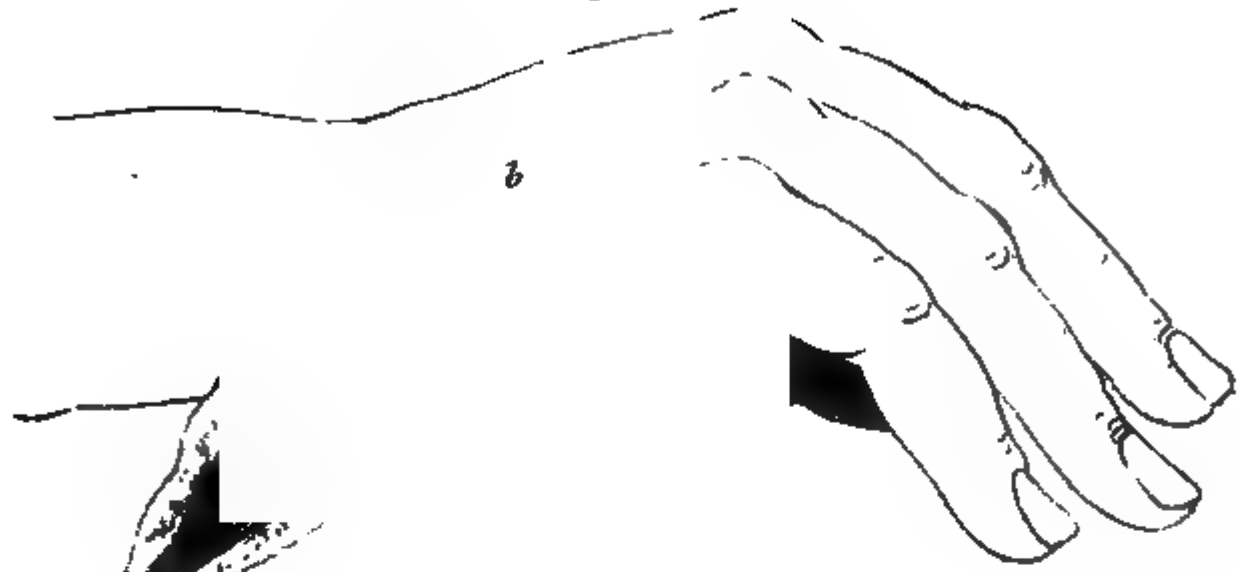


Fig. 2.



... a
.....c

b..

e

e

W. Cocks

Fig 1

Plate A +

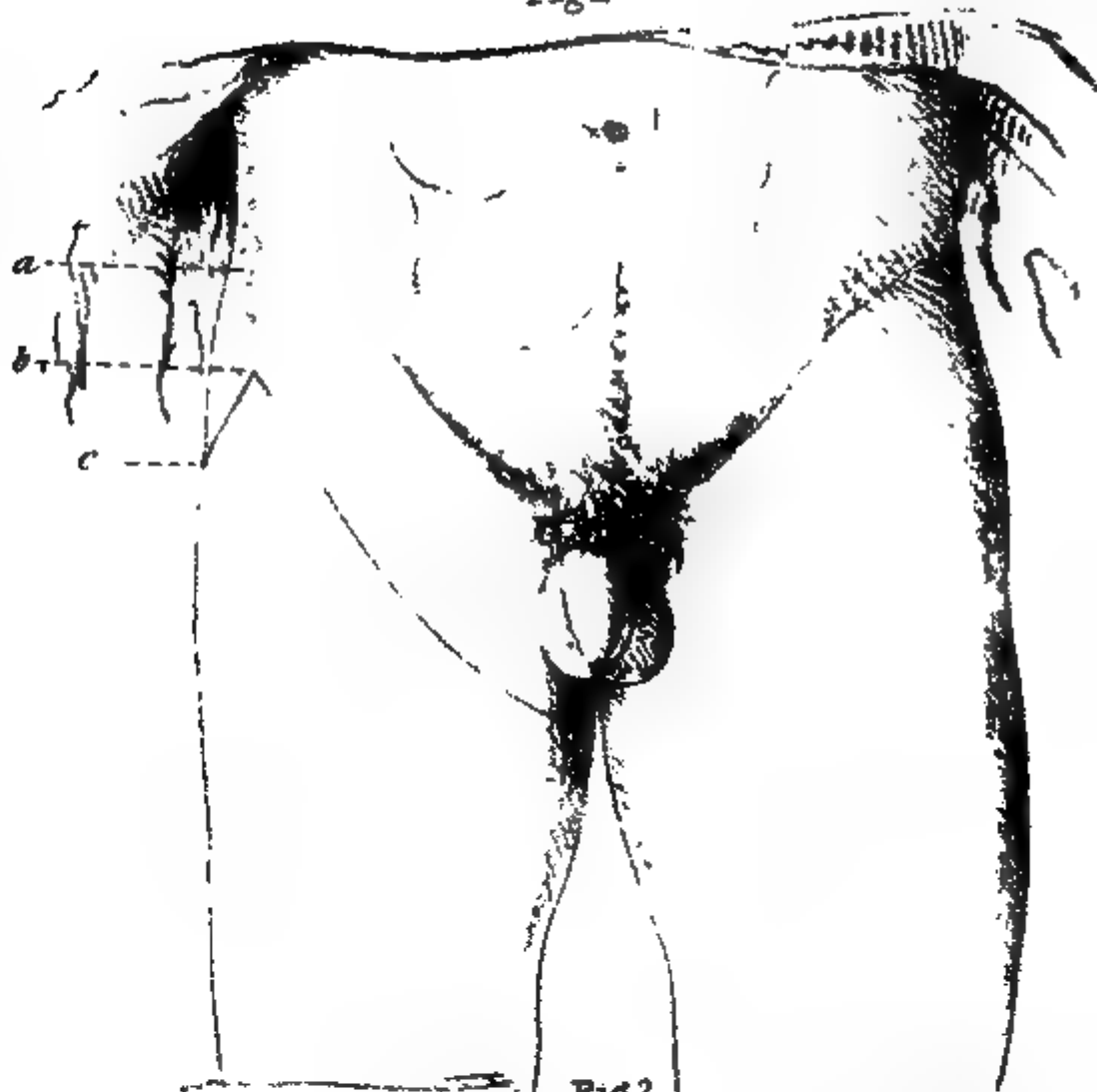


Fig 2



W. Cocks

PLATE A. 4.

Amputation at the Hip-Joint

Fig. 1.

- a.* The anterior superior spinous process of the ilium.
- b.* The first incision, commencing about four fingers' breadth and in a direct line below the anterior superior spinous process of the ilium, in a well-proportioned man; and continued round in a slanting direction, at an almost equal distance from the tuberosity of the ischium, nearly opposite to the place where the incision commenced.

Fig. 2.

The wound made after the removal of the bone, and united by sutures. Sometimes the line of union is more horizontal.

- a.* The anterior superior spinous process of the ilium.
- b.* The commencement of the line of incision,

See pages 90 to 95.

which runs down to c. or the tuberosity of the ischium.

NOTE.—M. Lisfranc gives the following direction to ascertain the exact situation of the hip-joint under any circumstances. In the First place, if a line about an inch and a quarter in extent be drawn from the apex of the anterior superior spinous process, parallel to the axis of the limb; and another transverse line be drawn from the end of this, it will pass on the outer and anterior surface of the joint, about an inch and a half to the inner side of the former. Second:—A line, half an inch in length, drawn parallel to the axis of the limb, from the anterior inferior spinous process of the ilium, will fall on the superior part of the joint. Third:—If a line, two inches and a quarter long, be drawn from the spine of the pubes, and directed transversely outwards, the joint will be found at a quarter of an inch below its extremity. Fourth:—Lastly, if a right-angled triangle be drawn, one of the sides of which, about half an inch long and parallel to the axis of the limb, terminates inferiorly on the fore and upper part of the great trochanter; and the other side, of an inch in length, be directed transversely inwards, the superior and internal angle will correspond to the outer side of the head of the femur.

Plate A. A. a

17

HP Cocks

PLATE A. 4. *a*.

This sketch represents a singular case of a successful amputation at the hip-joint, performed January 17th, 1824, on William Jones, aged 47, at Guy's Hospital, by Sir A. Cooper, Bart.

PLATE A. 5.

*Circular Amputation of the Thigh.**

This sketch represents the manner in which the first incision is to be made.

Operation.—The patient is generally seated on the side of a table, with his back against a mattress or pillow; the tourniquet is applied as high as possible on the course of the femoral artery, or an experienced assistant makes compression against the os pubis with his fingers or a pad.

The artery being compressed, the arm of the operator is carried under the limb, till the knife reaches almost round to the same side on which he stands; with one sweep penetrating to the fascia, the knife is brought round to the point where it first touched the skin; dissect them back as far as may be thought necessary for the purpose of covering the stump. You are then to cut through the superficial set of muscles, and divide the deeper seated

* In consequence of a mistake in the placing of this sketch on the stone, the surgeon is represented operating with his left hand.

Plate A. 5



W. Cocks

muscles situated immediately round the bone, at least two inches higher up than the spot at which you commenced your incision through the superficial set of muscles: this will prevent the formation of a conical stump. The superficial muscles will contract, but the deeper ones cannot on account of their connection with the bone. The arteries to be secured are, the femoral, profunda, and that branch which runs in or by the side of the sciatic nerve.

PLATE A. 6.

The second stage of the operation.—It represents the integuments freely divided, and considerably retracted.

- a.* The divided integuments.
- b.* The fascia.
- c.* Extensive disease of the knee-joint.
- d.* The bandage.
- e.* The tourniquet.
- f.* A portion of the bandage encircling the abdomen.

Plate A 6

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PLATE A. 7.

*The Method of applying the Retractor.**

- a.* Posterior part of the thigh.
- b.* The retractor, supporting and protecting the soft parts from the teeth of the saw when employed in dividing the bone.
- c.* Os femoris.
- d. d.* The muscles of the thigh.
- e.* The fascia.
- f.* The integuments.

* All the muscular fibres on every side having been cut down to the bone, a piece of linen, somewhat broader than the diameter of the wound, should be torn at one end along its middle part, to the extent of about eight or ten inches.

This is called a retractor, and is applied by placing the exposed part of the bone in the slit, and drawing the ends of the linen upward on each side of the stump.

See page 73.

PLATE A. 8.

The method of bringing the lips of the wound together by means of strips of adhesive plaster.

a. a. a. Strips of adhesive plaster keeping the edges of the wound in close contact.

b. b. b. Ligatures.*

* After amputation, having disposed your ligatures in a line with each other, and leaving them to hang out at the most depending part of the wound, all that you have to do, is, to apply your adhesive straps, and other bandages if necessary.

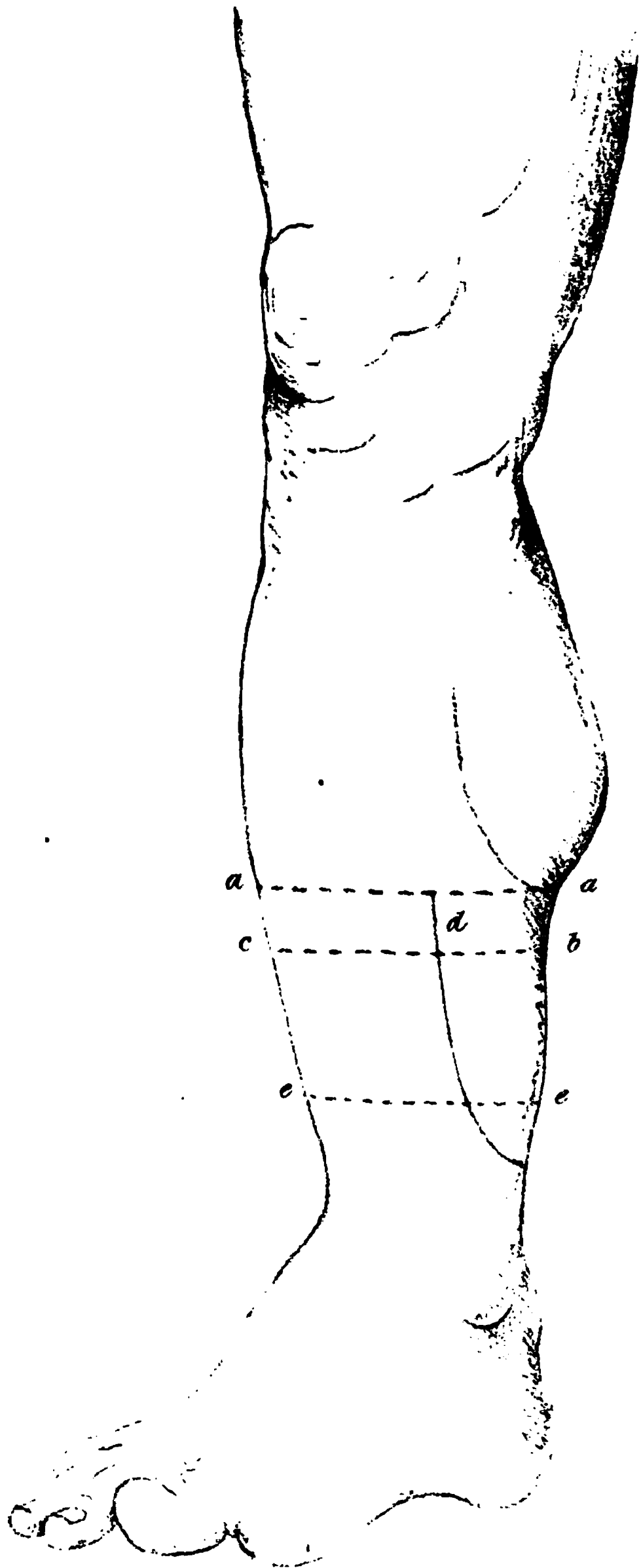
See page 77.

Plate A 8

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PLATE A. 9.

Flap Operation of the Leg.

- a. a.* The highest circular line, where the bones are to be sawn through.
- d.* The course the catling ought to take in the formation of the flap.
- e. e.* A circular line, a little below which the catling ought to be brought out.
- b. c.* A circular line, made one inch below the superior one, where the integuments are to be divided.
- c. to d.* Marks the course of the incision through the skin, on the anterior part of the leg.

Mr. Hay says :—To ascertain, with precision, the place where the bones of the leg are to be divided with the saw, together with the length and breadth of the flap, I draw upon the limb five lines ; three of them circular, and two longitudinal. The situation of these lines is determined in the following manner :—I first measure the length of the leg from

See pages 86 to 88.

quantity of muscular flesh can be conveniently preserved below the extremity of the divided bones, on account of the adhesion of the muscles to the bones; nor is it necessary, as the flap, when made in the middle of the leg, contains a portion of the gastrocnemius and soleus muscles, sufficient to make a good cushion for the extremity of the bones. When the bones are sawn through, it is advisable to cut off a little of the extremity of the conjoined flat tendon of the gastrocnemius and soleus muscles, as it is apt to project beyond the skin when the flap is placed in its proper situation. The large crural nerve is frequently found lying upon the inner surface of the flap: it should then always be dissected out; and when gently extended, should be divided near the extremity of the stump. By this method, it will retire so far as to suffer no compression from the flap.

Plate 21



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PLATE A. 10.

Circular Amputation of the Leg.

Operation.—The patient is to be placed upon a firm table, as in the amputation of the thigh ; and the leg being properly held by an assistant, while the integuments are drawn up by another, the surgeon, with one quick stroke of the knife, is to make a circular incision about two hands breadth below the patella, through the integuments, all around the limb.* This being completed, the muscles are to be cut through, nearly on a level with the first incision, and down to the bones. The interosseous ligament between the tibia and fibula is to be divided with the catling ; and as several of the

* The limb should be a little bent, and the circular incision made with the catling, through the skin and integuments to the bone on the fore part, and to the muscles on the outside and back part ; and as the attachment of the skin to the bone will not readily allow of its retraction, it must be dissected back all round, and separated from the fascia—the division of which, in the first incision, would avail nothing, from its strong attachments to the parts beneath.

See pages 83 to 85.

muscles cannot retract, in consequence of their attachments to the bones, they are to be separated with the knife ; and in the same manner the inter-muscular septa, or expansions running between them, are to be divided, as they will still prevent their retraction.

Much attention is necessary, when sawing the bones, not to splinter them ; to guard against such an occurrence, and to prevent their protrusion, the fibula ought always to be sawn before the tibia ; in order to effect which, the surgeon should stand at the inside of the leg, which position will permit him either to saw both bones together, or to divide the fibula first ; on the contrary, if he stands at the external side, he must fall on one knee to be in a proper situation to make the section of the fibula before that of the tibia, or depress his hand to such a degree as not to be able to use it but with difficulty.

The arteries to be secured are, the anterior and posterior tibial, and sometimes the anterior and posterior interosseal ; in tying the posterior tibial artery, take care not to include in the ligature the nerve which accompanies it.

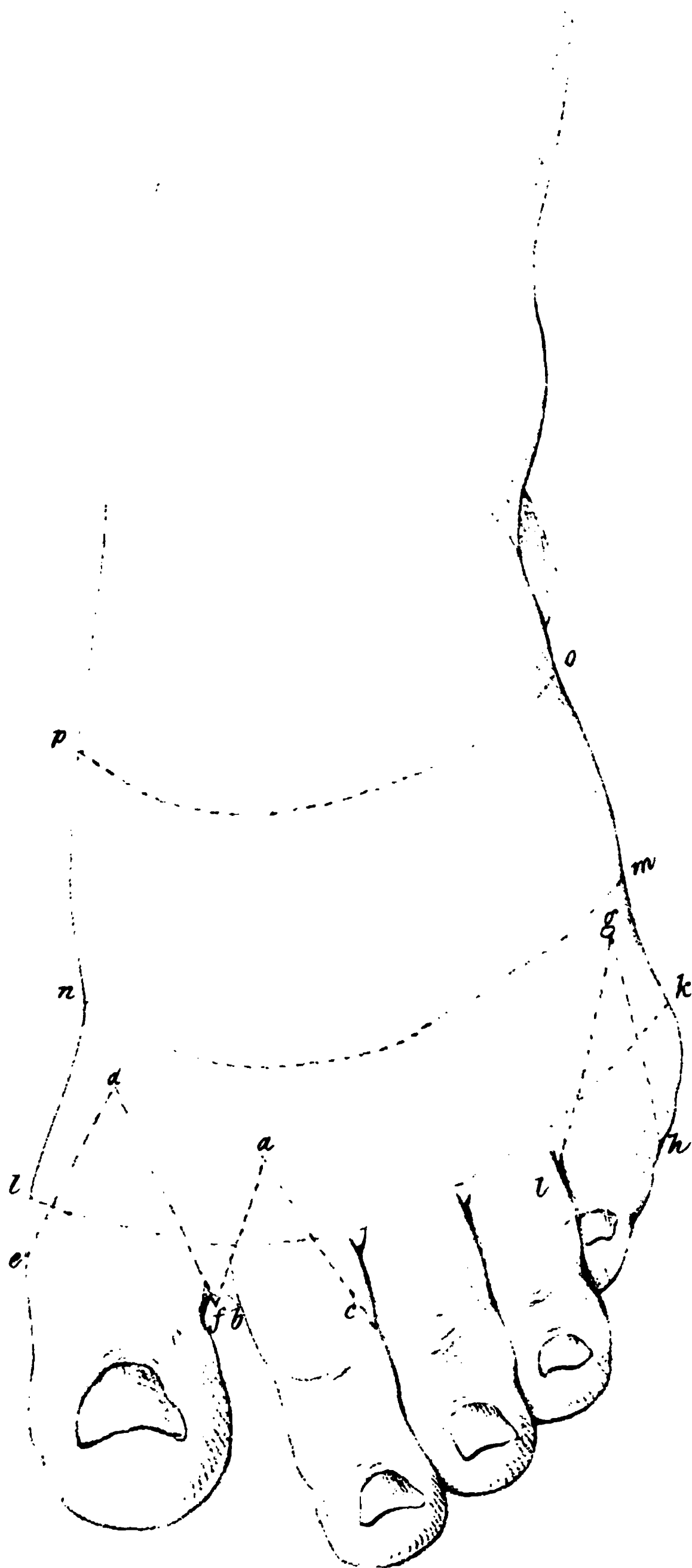


PLATE A. 11.

Represents the foot crossed by lines, which are bounded by letters, indicating not only the different kinds of amputations, but also the course of the knife. The direction of the lines marks out the incisions; the letters determine the extent.

a. b. c. Amputation of the toes at the metatarsal articulation.

d. e. f. Amputation at the continuity of the first metatarsal bone.

g. h. i. Amputation at the continuity of the fifth metatarsal bone.

k. l. Amputation between the metatarsus and first phalanges.

m. n. Amputation at the tarso-metatarsal articulation.

o. p. Amputation between the astragalus and os scaphoides, os calcis and os cuboides.

PLATE A. 12.

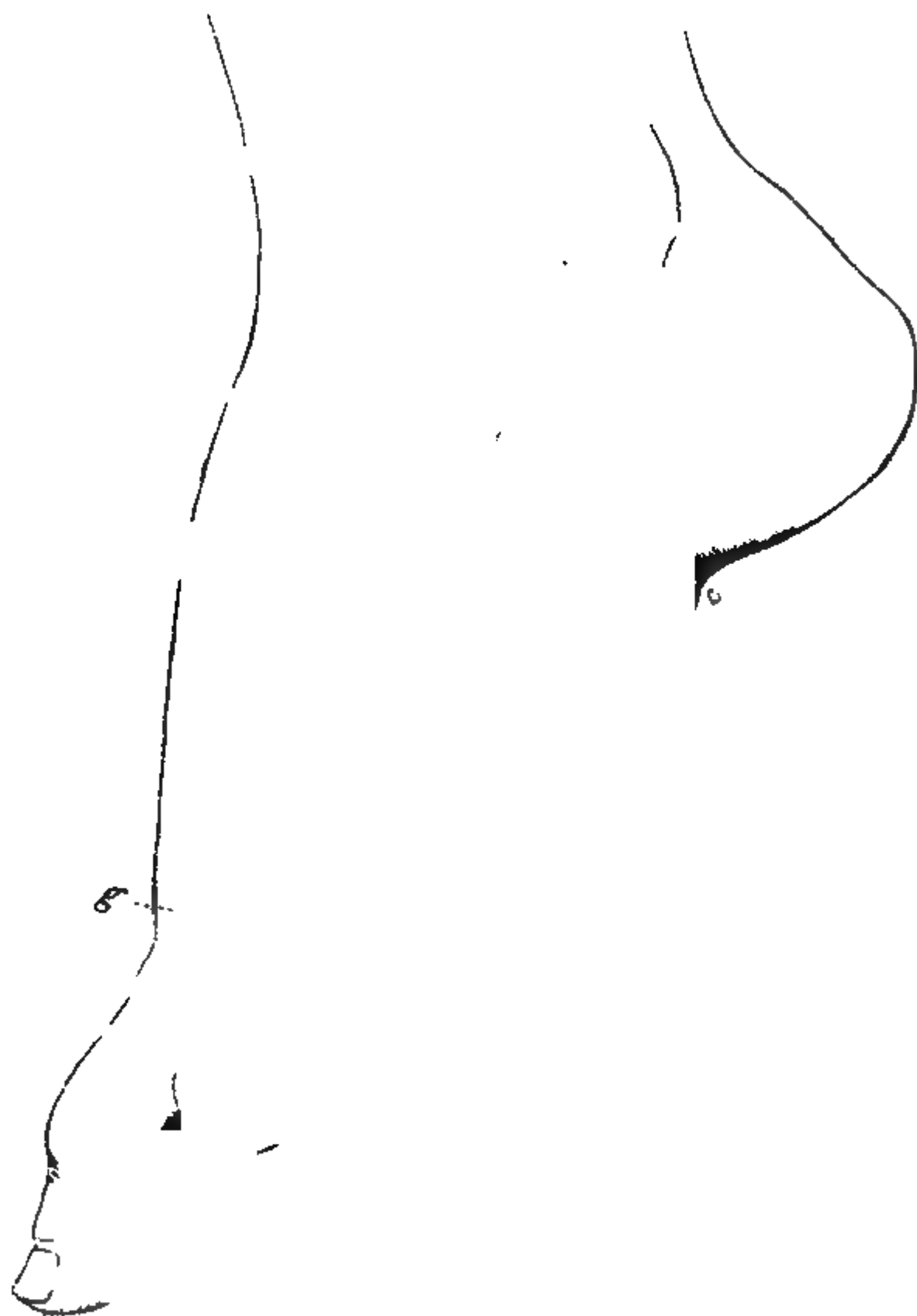
Amputation in the continuity of the First Metatarsal Bone.

The foot is to be held firm by an assistant, the bistoury to be thrust on the inner margin of the first metatarsal bone from *a.* and *b.* to *c.*; the flap thus formed is to be carried backwards: a second incision is then to be made on the outer margin from *d.* *e.* to *f.*—both to be connected by a transverse ——. The bone to be sawn through obliquely.

- g.* The plantar arteries.
- h.* Muscles of the foot.
- i.* Oblique surface of the bone.

See pages 104 to 106.

Plate A 12



W. P. Cocks

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PLATE A. 13.

Amputation of the Foot at the Tarsus.

a. a. The course of the incision on the dorsal region of the foot.

Operation.—The joints of the metatarsus, with the tarsus, being well ascertained, an incision is to be made across the foot, in the direction of the joints, but from half to three quarters of an inch nearer the toes, and the integuments drawn back over the tarsus.

From the extremities of this incision two others are to be made, along the sides of the great and little toe, for about two inches and a half, according to the thickness of the foot; and the ends of these two incisions are to be united by a transverse one down to the bone, on the sole of the foot. The corners being rounded off, as in Plate 14.

The flap thus formed on the under part is to be dissected back from the metatarsal bones, including

See pages 104 to 106.

as much of the muscular parts as possible, as far as the under part of the joints of the tarsus.

The metatarsal bones are now to be removed, by cutting into and dislocating each joint from the side, commencing on the outside, by placing the edge of the knife immediately above but close to the projection made by the posterior part of the metatarsal bone supporting the little toe,—which prominence is always readily perceived. The arteries are to be secured; any long tendons, and loose capsular ligament, are to be removed with the knife or scissors; and the under flap, formed from the sole of the foot, is to be raised up, so as to make a neat stump when brought into contact with the upper portion of the integuments that were first turned back: the whole to be retained in this position by sutures, adhesive plaster and bandage.*

* Mr. Guthrie, on "Gun Shot Wounds."

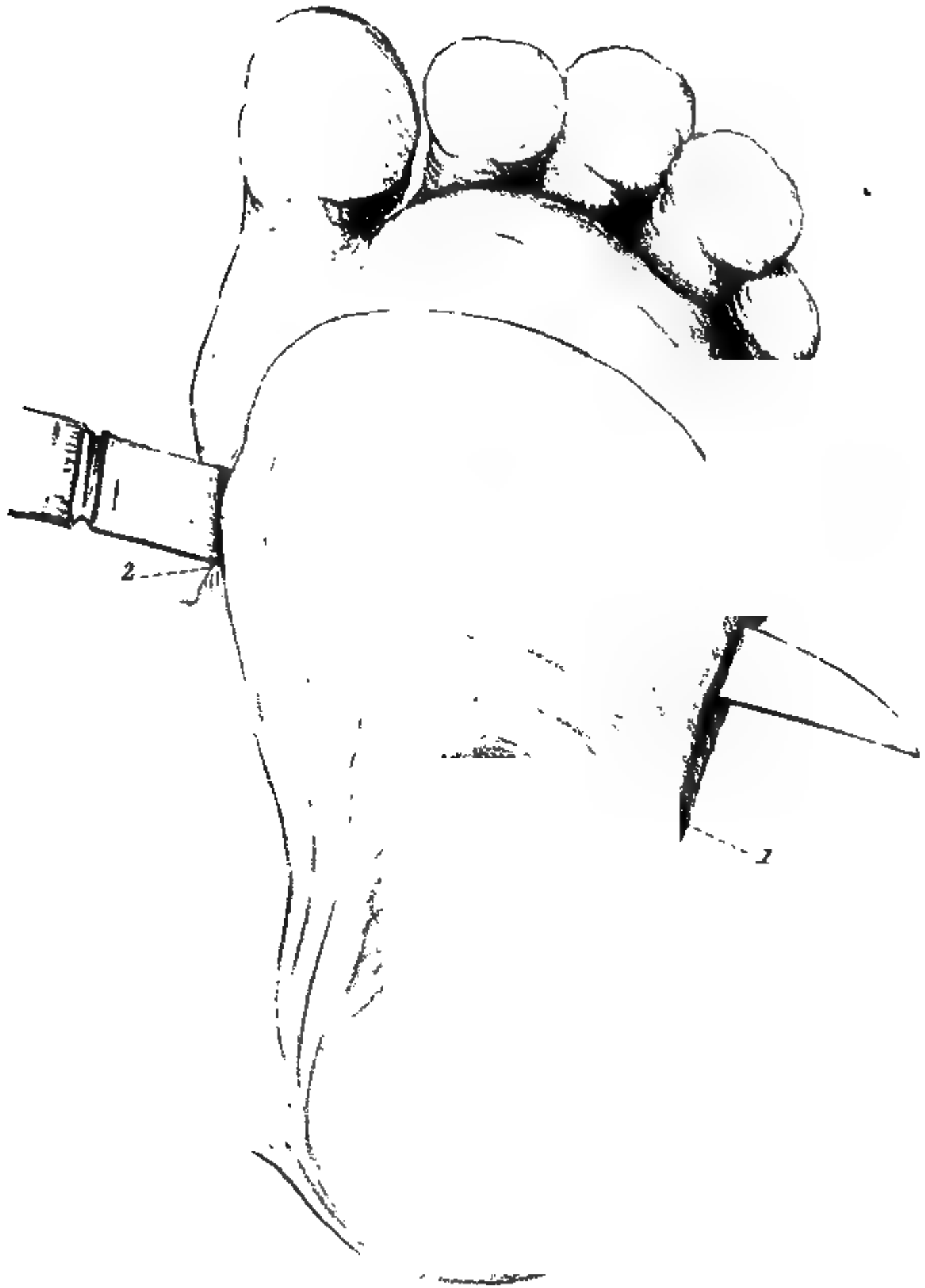


PLATE A. 14.

This sketch shews the line of incision,* for the formation of a flap, from the sole of the foot, in the same operation as Plate 13, which is to be raised up to cover the tarsus when the metatarsal bones and toes are removed.

* In sliding the catling flatwise between the skeleton and the flesh, the concavity of the bones readily admits of its being conducted as far as their phalangeal bulging; but that then it will be necessary to depress the edge of the instrument very considerably, in order to terminate the incision.

PLATE A. 15.

*Amputation of the Foot at the Tarso-Metatarsal Articulation.**

- a.* The integuments on the dorsal region of the foot.
- b.* The flap, formed from the plantar surface of the foot.
- c.* The extent of the semicircular incision on the dorsum of the foot.
- d.* Os cuboides.
- e.* Os cuneiforme medium.
- f.* Os cuneiforme internum.
- g.* Os cuneiforme externum.
- h. i. k.* Plantar arteries.

* The great object in this operation, for its quick performance, is, to mark out the line of the articulations, which may be always effected by the following rule :—as the tubercle of the fifth metatarsal bone can be always discovered in every foot, it will point out the situation of the joint on this side ; if from it, a line be drawn at right angles to the axis of the foot, to its internal side, about half an inch anterior to the place at which it terminates, the articulation will be found, between the first metatarsal, and internal cuneiforme bones ; or if the tendon of the tibialis anticus muscle is very evident, an inch or so anterior to it will also shew the articulation.

Plate A 15

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PLATE A. 16.

Amputation at the articulations between the first phalanges and the metatarsal bones.

M. Lisfranc's method of operating.—Supposing it the left extremity to be operated on, and the foot steadily fixed by an assistant, the operator feels for the head of the first phalanx of the great toe, which joins the metatarsal bone, and on it places his left thumb; on the same extremity of the little toe he places his left index finger,—the toes resting in the palm of his hand. He then, with a narrow-bladed catling, or amputating knife, makes a semicircular incision, from the point marked by his thumb to that before his index finger, cutting through the integuments and tendons. By a second cut in the same direction he opens the joint, and bending the toes downwards cuts through the ligaments surrounding the articulation. Keeping the toes still bent, he passes the knife horizontally a little way beneath the under surface of the bones, so as to get clear of the articulations. Then raising the toes, and pressing them upwards, he lowers the handle of his knife, and with the point completes the flap

from their under surface by cutting to the commissure of each, separately, beginning at the great toe,—the assistant raising them in regular order, as the knife cuts through the integuments below. In this way a flap is formed of sufficient size to cover the heads of the metatarsal bones, and unite with the divided integuments above.

The arteries which require ligatures being tied, the cut edges are to be kept in contact by adhesive plaster.

In performing the operation on the right foot, the first incision is made from the little toe inwards, and finished in the same manner,—the operator cutting from left to right.

A N E U R I S M.*

THE disease of aneurism, which consists in a permanent dilatation or breach of the coats of an artery, may be produced by external violence, as a strain, or puncture, or by arterial debility.†

The last is the more common cause; and it may be local or general: it may be limited to the part in which the aneurismal swelling occurs, or it may extend through the whole range of the arterial system, which is sometimes found to be universally, though irregularly feeble, and consequently feebler in some parts than in others.

* Aneurism, is a pulsating tumour containing blood, and communicating with the interior of an artery; when seated in one of the extremities, or upon any superficial branch, it is generally called external; when situated upon any of the arteries of the cavities, as the abdomen or thorax, it is termed internal.

† According to some surgical writers, the causes of aneurisms operate, either by weakening the arterial parietes, or by increasing the lateral impulse of blood against the sides of these vessels. Thus they are said to be occasioned by violent concussions, the abuse of spirituous drinks, frequent mercurial courses, fits of anger, rough exercise, etc. etc. etc.

True Aneurism.*—In consequence of the local dilatation of a part of an artery, but more frequently without any previous dilatation, the internal coat being ulcerated or lacerated from a slow internal cause in some point of its circumference, the blood impelled by the heart begins immediately to ooze through the connections of the fibres of the muscular coat, and gradually to be effused into the interstices of the cellular covering, which supplies the place of a sheath to the injured artery, and forms for a certain space, a kind of ecchymosis, or extravasation of blood, slightly elevated upon the artery. Afterwards, the point of contact between them fills and elevates in a remarkable manner the cellular covering of the artery, and raises it after the manner of an incipient tumour. Thus the fibres and layers of the muscular coat being wasted or lacerated, or simply separated from each other, the arterial blood is carried with greater force and in greater quantity than before into the cellular sheath of the artery, which it forces more outwards.

Finally, the divisions between the interstices of the cellular coat being ruptured, it is converted into

* In the true aneurism, the artery is either enlarged at only a small part of its track, and the tumour has a determinate border, or the vessel is dilated for a considerable length; in which latter circumstance, the swelling is oblong, and loses itself so gradually in the surrounding parts, that its margin cannot be exactly ascertained.—The first case, which is the most common, is termed the circumscribed true aneurism; the last, the diffused true aneurism.

a sac, which is filled with polypous concretions, and with fluid blood; and at last forms, properly speaking, the aneurismal sac,—the internal texture of which, although apparently composed of membranes placed one over the other, is, in fact, very different from that of the proper coat of the artery; notwithstanding the injured artery, both in the thorax and in the abdomen, as well as the aneurismal sac, is covered externally, and inclosed within a common smooth membrane

Symptoms.—In true aneurism, the first thing the patient perceives, is an extraordinary throbbing in some particular situation; and on paying a little more attention, he discovers there a small pulsating tumour, which entirely disappears when compressed, but returns again as soon as the pressure is removed. It is commonly unattended with pain or change in the colour of the skin. When once the tumour has originated, it continually grows larger, and at length attains a very considerable size. In proportion as it becomes larger, its pulsation becomes weaker; and, indeed, it is almost quite lost when the disease has acquired much magnitude. In proportion as the aneurismal sac grows larger, the communication into the artery beyond the tumour is lessened. Hence in this state the pulse below the swelling becomes weak and small, and the limb frequently cold and œdematous.

False Aneurism—is a tumour formed by the effusion

of blood into the adjoining cellular tissue, either immediately after a wound, or in consequence of the rupture of a cicatrix.

Symptoms.—The swelling produced by the infiltration of blood into the cellular tissue of the part is uneven, often knotty, and extends upwards and downwards along the track of the vessel. The skin is also usually of a dark purple colour. Its size increases as long as the internal hæmorrhage continues; and if this should proceed above a certain pitch, mortification of the limb ensues.

Internal Mixed Aneurism—is said to take place, when the external cellular,* muscular,† and internal cellular tunic‡ are destroyed, and allow the internal or serous membrane§ to protrude through the open-

* The external cellular tunic of an artery may be easily separated into three layers. These layers are gradually, as they proceed inwards, changed in their nature from that of the general investing cellular membrane; and are at last incorporated into a more regular coat, which has been termed the tendinous coat; it is dense, white and elastic, and has much more toughness than the inner coats.

† Having removed the outer layers, the muscular coat appears. It consists of pale fibres, coiled obliquely round the circumference of the vessels, but none of them forming a complete circle. If an artery be stretched transversely, it will retract.

‡ The internal cellular, is the connecting medium betwixt the muscular and serous tunics. This coat is difficult to be demonstrated; but by slitting up the artery, and separating the serous coat, its existence may be shewn.

§ The serous, or innermost membrane, is a continuation of that

ing, so as to form a tumour, of a globular shape, filled with blood.

Venous Aneurism.—A tumour arising from a preternatural and direct communication formed between a large vein and a subjacent artery.*

Symptoms.—There arises over the artery, a few weeks after the accident, a flat swelling of the vein, with the mark of the lancet in the middle of it. On placing the finger upon this tumour, a faint pulsation or vibratory motion is felt. There is a noise, or at least a peculiar feeling which conveys that idea, “between thrilling and whizzing.” The tumour gradually extends from the median-basilic to the other veins; but the varicose enlargement is chiefly of the median-basilic, median-cephalic, basilic and cephalic veins.

which lines the left cavities of the heart. It is very thin, fine, transparent, absolutely destitute of fibres, smooth, and as if serous; it breaks and tears with the greatest facility.

The coats of the arteries are supplied with a very complicated net-work of minute arteries, called vasa vasorum. They may be distinctly seen in all vessels that are not less than half a line in diameter; but they cannot be traced into the substance of the serous coat.

The nerves of the arteries are so very small, that they are traced with difficulty: they are supplied by the spinal marrow, and great sympathetic nerve; and are principally distributed to the fibrous coat.

* This disease generally arises from pricking the artery while bleeding in the arm.

Arterial Anastomosing Aneurism—begins from a mark which had existed as a discoloured spot from birth; or it appears, at first, like a small fiery pimple; or it succeeds a blow, or some other injury; or it begins without any obvious exciting cause. In whatever way it begins, it is at first small, but gradually increases in size; the pulsation, which originally was obscure, becomes a prominent feature in the complaint; the swelling still enlarges; the pain, and feeling of distention augments; and when the cells are enlarged into sacs, and the mutual communications consequently free betwixt the extreme arteries and veins, the whole tumour pulsates distinctly: and when excited by exertion, or muscular struggles, it throbs furiously; the tumour assumes then a purple hue; the apices of the sac become sensibly thin; the patient is alarmed, from time to time, with slight hæmorrhages, which becoming more frequent from various points, and very profuse, he is at last debilitated, changes his complexion and colour, loses his health, and dies.

Diagnosis of Aneurism.

Aneurism may be distinguished from other diseases by the following marks:—If the aneurism be small, press the artery which leads to it, and you will empty the aneurismal bag; but if the aneurism has existed long, is very solid, and its pulsation not

very strong,—sit by the patient's side, observe carefully the size of the swelling, press your finger on the artery above, and the aneurism will sink under the pressure on the artery; upon giving up that pressure, suddenly a jet of blood rushes into the aneurismal bag, and raises it to its former height.

Morbid Anatomy.

When an aneurismal sac is opened and turned back, the cavity in which the blood is contained is not immediately exposed, but numerous layers of fibrous matter line the inner part of the sac, and form laminæ within each other,—within which the fluid blood is contained. These laminæ are largest towards the sac, and form a portion of a lesser circle as they approach the fluid blood; these being removed, and the fluid, or the recently coagulated blood being sponged away, the orifice of the artery into the sac is directly seen; sometimes this orifice is small, and is formed by a portion of the circumference of the artery, and is sometimes large, the whole circumference of the artery having given way.

PLATE B. 1.

An Aneurism of the Aorta; in which was included a considerable part of the Arteria Innominata.

- a. a.* The right and left ventricle of the heart.
- b.* Pulmonary artery.
- c.* The aorta, which is considerably dilated just above its origin.
- d.* The arch contracted to its proper size.
- e.* The aneurismal tumour, involving the root of the arteria innominata.
- f.* The sternum displacing (*p*) the clavicle, the sternal extremity of which is sunk into the coats of the sac, and roughened by partial absorption of its substance.
- h.* Cricoid cartilage.
- i.* The left carotid artery.
- k.* The thyroid cartilage.
- l.* Slight dilatation of the descending aorta.
- m.* The trachea.
- n.* Œsophagus forced completely from behind the windpipe.
- o.* The left subclavian artery.

Plate B.7



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PLATE B. 1. *a*.

Posterior view of the same aneurism.—It is intended to illustrate the way in which the arteria innominata (*a*) is connected with the tumour; and how the sac extended upward, between the right carotid and the right subclavian and the sternum, by which both of these vessels were forced backward against the spine.

- b*. The right carotid artery.
- c*. The right subclavian artery.
- d*. The vena cava superior.
- e*. The trachea.
- f*. Œsophagus.
- g*. Clavicle.
- h*. First rib.
- i*. Left carotid artery.

PLATE B. 1. *b*.

*Aneurism of the Arch of the Aorta.**

a. a. a. a. The pericardium thrown back from the lower half of the aneurismal tumour.

b. Thoracic portion of the aorta.

* When the aorta is the seat of the aneurism, the tumour may make its way through the sternum or ribs, and protrude externally. It may also attack the bodies of the vertebræ, eat its way through the spinal canal, and by pressing on the spinal cord produce sudden paralysis. It is remarkable that the intervertebral cartilages often remain uninjured in these cases.

Sometimes the aneurism presses against the organs contained in the thorax, or abdomen; and in this way may compress or perforate the pulmonary artery, the superior cava, the thoracic duct, the œsophagus, the trachea, the bronchial tubes, the lungs, the stomach, or some convolution of the intestine. It may burst either into the pleura, or into the peritoneum. The veins which run in the neighbourhood of aneurisms, are often compressed, or even obliterated; the nerves are flattened, like ribands; and the muscles are wasted in a remarkable degree. When the tumour is in contact with a bone, the periosteum is in some cases destroyed; and the bone, thus deprived of its fibrous envelope, becomes carious; in other cases, again, the periosteum is remarkably thickened: and occasionally it secretes an osseous substance, which surrounds the tumour, and forms an envelope to it.

Plate B16



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Plate B1c



PLATE B. 1. c.

An Aneurismal Tumour above the Pericardium.

- a.*** Root of the aorta.
- b.*** Thoracic aorta.
- c.*** Pericardium.
- d.*** Pulmonary artery.
- e.*** Corrugated appearance of the internal surface of the sac.
- f.*** The hole of communication between the aorta and sac.
- g.*** Left subclavian artery.
- h.*** Left carotid artery.
- i.*** Right carotid artery.
- k.*** Thickened and indurated state of the aneurismal sac.
- l.*** Right subclavian.

- c. c. Extent of the aneurismal pouch above and below the pericardium.**
- d. Communication between the aorta and pouch.**
- e. Corrugated state of the inner surface of the artery.**
- f. Muscular coat of the artery.**
- g. External cellular coat.**
- h. Right branch of the pulmonary artery.**
- i. Left branch of the pulmonary artery.**

Plate Bld

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PLATE B. 1. d.

Aneurism of the Carotid Artery.

In this sketch, the vessel is slit open so as to expose the ulceration and perforation of its coats.

- a.* The carotid artery.**
- b.b.* The divided surfaces of the artery thrown back.**
- c.* The hole of communication.**
- d.d.* The posterior surface of the aneurismal tumour.**

PLATE B. 1. e.

An Aneurismal Tumour of the Thoracic Aorta.

A portion of the posterior part of the pouch was destroyed, and the vertebra filling up the aperture was also very much corroded. The cellular coat of the sac surrounding the edges of the diseased vertebra was thickened, and of a fibro-cartilaginous texture.

- a.* Thoracic aorta.
- b.* Intercostal branches.
- c.* The cellular coat.
- d.* Irregular and ragged appearance of the muscular coat of the artery.
- e.* Inferior portion of the sac.
- f.* Abdominal aorta.
- g.* Cœliac artery.

Plate B1c

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PLATE B. 2.

Aneurism of the Abdominal Aorta.

- a.* Abdominal aorta.
- b.* Middle sacral artery.
- c.* Lobulated state of the tumour.
- e. e.* Common iliac arteries.
- f.* Right external iliac artery.
- g.* Left external iliac artery.
- h. h.* Internal iliacs.
 - i.* The artery, split open so as to shew its inner surface.
 - k.* The hole through which the blood passed to the sac.
 - l.* Layers of fibrous matter contained in the tumour.

PLATE B. 3.

Aneurism of the External Iliac Artery.

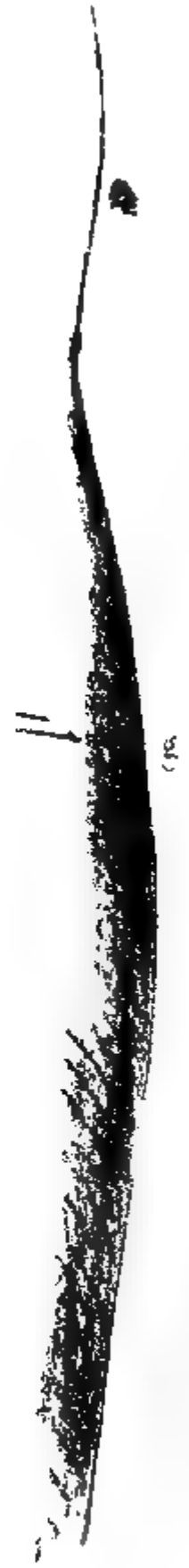
- a. a.* The divided integuments, kept asunder so as to expose the tumour in the inguinal region.
- b. b. b.* The fascia of the thigh.
- c.* Poupart's ligament.
- d.* The aneurismal tumour.
- e.* The femoral artery.
- f.* The femoral vein.
- g. g.* Two hooks, employed to keep the integuments back.

Plate B 3



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W. Cocks



Common Iliac Arteries.

These arteries result from the bifurcation of the aorta, opposite the body of the fourth lumbar vertebra, or upon the fibro-cartilage which unites that vertebra to the fifth. They are of equal size, and descend, separating from each other, at an acute angle. The right iliac crosses the lower part of the vena cava, near the origin of the iliac vein. The left leans on the outside of its concomitant vein, but does not cover it. A little below, each divides into two branches, which are called hypogastric, and external iliac: the former branch sinks into the cavity of the pelvis; the other passes to the thigh, where it takes the name of femoral. In their course they give off no branches. They only send a few slender twigs to the walls of the iliac veins, the peritoneum, the lumbar lymphatic ganglia, and the ureters.

Internal Iliac, or Hypogastric.

In the adult, the internal iliac artery is a short-stunted trunk, extending from the sacro-iliac symphysis to the sacro-sciatic notch, opposite to which it may be said to terminate, by dividing into several branches; for none of them can be regarded as a continuation of it, or as following its course. The external side of the artery, just at its origin, is in

contact with the inner border of the psoas muscle; lower down, it rests against part of the sacral plexus. Behind it is situated the internal iliac vein, and the communicating branch which passes from the lumbar to the sacral plexus; in front it is crossed by the ureter, which separates it from the peritoneum.

The great number of branches which arise sometimes separately, and sometimes by common trunks, may be distinguished into posterior,* anterior,† internal,‡ and inferior.§

The External Iliac Artery,

Passes on each side over the inner and fore part of the psoas muscle, lying upon the fascia iliaca in somewhat of a curved direction, along the brim of the pelvis, to pass under the crural arch, midway between the spine of the ilium and symphysis pubis.

** Posterior.*

The ilio-lumbar artery.
The sacro-lateral artery.
The gluteal artery.

† Anterior.

The umbilical artery.
The vesical artery.
The obturator artery.

‡ Internal.

The middle hæmorrhoidal artery.
The uterine artery.
The vaginal artery.

§ Inferior.

The ischiatic artery.
The internal pudic artery.

This artery is in a considerable degree connected to the fascia, over which it runs ; while the peritoneum lining the back part of the pelvis, is very loosely lying upon it. This artery gives off a few inconsiderable branches, that are distributed to the peritoneum, psoas muscle, corresponding vein and lymphatic glands, until it is about to pass to the thigh, where the epigastric and circumflexor ilii arteries are seen to arise.

Operation for tying the Internal Iliac Artery.—The lateral and inferior part of the abdomen is divided parallel to the course of the epigastric artery ; then the peritoneum must be detached from the surface of the iliacus and psoas muscles, in the direction of a line extending from the anterior and superior spinous process of the ilium, to the spot where the common iliac bifurcates ; and lastly, the operator laying hold of the internal iliac between his forefinger and thumb, ties it.

Operation for applying a Ligature to the External Iliac Artery.—The patient is to be placed upon a table, as for the operation for hernia ; and his groin being shaved, the surgeon will proceed with a scalpel to make an incision through the common integuments, commencing at about an inch from the anterior superior process of the ilium towards the pubis. This incision will be carried for a little short of three inches in length, in a line about half an

inch above and nearly parallel to Poupart's ligament; its inner extremity taking a slight curvature upwards, that it may end over the spermatic cord as it passes through the external abdominal ring.

The integuments will be dissected downwards, until in a line with the ligament; then upwards, for about an inch throughout the whole course of the incision.

By this the tendon of the external oblique muscle is to be cleanly laid bare, and afterwards divided for two inches and a half in the direction of its fibres; the incision terminating a little short of the external abdominal ring. This cut will also take a course about half an inch above Poupart's ligament. The tendon is now to be elevated by the handle of the knife from off the internal oblique muscle, so that the oblique canal may be clearly exposed. This will be found of easy accomplishment; for it is only connected to the parts below by a very delicate reticular membrane, which can be readily broken through.

The spermatic cord will now be seen taking passage towards the external ring, from under the edge of the internal oblique muscle, about two inches from the pubis. This part is to be lifted on the finger, in order that its sheath, the cylindrical process of fascia which proceeds from the ring, may be opened. This will be done by lifting the pellicle with a pair of dissecting forceps, and then cutting slightly with scissors or scalpel. When this is ac-

complished, the little finger of the right hand will be passed into the opening, and the sheath will direct it to the internal abdominal ring, immediately behind which will be felt the pulsation of the external iliac artery. The peritoneum will not be found much in the way in this operation. Pressing a little against its angle with the finger, will elevate it sufficiently to allow of the artery being secured.

An aneurismal needle of silver being now introduced through the internal abdominal ring, it will be insinuated under the artery from its outer side, and moved a little below that the vessel may be separated from the fascia iliaca, with which it is pretty firmly connected, as well as from the iliac vein, to which it is also attached. The artery will now be elevated through the ring. This will be accomplished more readily by raising the thigh towards the abdomen, and then a silken ligature of sufficient size is to be passed through the eye of the instrument, that it may be drawn under the vessel. The artery will now be tied above the going off of the epigastric and circumflexor ilii vessels; and the ligature, when the part is dressed, is to be allowed to remain without the external wound. One or two interrupted sutures may be applied through the integuments; and when a slight compress and a bandage have been added, the patient may be put to bed.

PLATE B. 3. *a.*

This plate is intended to exhibit the relative situation of the blood-vessels at the back part of the pelvis. It shews also the extent of the incision in the abdominal parietes required for securing the iliac arteries.

- a.* Vena cava abdominalis.
- b.* Aorta.
- c.* The part at which the ligature was applied around the aorta.
- d.* The situation of the ligature around the common or primitive iliac.
- e.* The ligature around the internal iliac.
- f.* The ligature around the external iliac, applied through the internal abdominal ring.
- g.* Superior mesenteric artery.
- h.* The termination of the left spermatic vein into the emulgent.
- i.* The termination of the right spermatic vein into the side of the cava.
- k. l.* The origin of the two spermatic arteries.
- m. m.* The ureters.
- n.* Inferior mesenteric artery.

Plate B 3 a.

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- o.* The iliacus internus muscle.
- p. p.* Psoas muscle.
- q.* The anterior superior spinous process of the ilium.
- r. r.* The absorbent glands.
- s. s.* Meeting of the spermatic vessels with the vas deferens, at the internal abdominal ring.
- t. t.* Epigastric vessels.
- u. u.* The divided edges of peritoneum and fascia transversalis, to expose the epigastric vessels.
- w.* The opening made into the parietes above Poupart's ligament, through which the ligatures were applied upon the common and internal iliac arteries.

PLATE B. 3. *b*.

This plate represents the external iliac artery of the right side, with two ligatures around it, that had been applied through the internal abdominal ring.

- a*. The common iliac artery.
- b*. The external iliac artery.
- c*. The internal iliac artery.
- d*. The external iliac vein.
- e*. The femoral artery.
- f*. The two silken ligatures around the artery, tied about the eighth of an inch apart.
- g*. The clot within the artery, of a dark brown colour.
- h*. The upper portion of the clot formed of coagulable lymph.
- i*. The origin of the circumflexa ilii.
- k*. The origin of the epigastric artery.
- l. m*. The external pudendal arteries.
- o*. A portion of the internal surface of the vein apparent, by being turned over.
- p*. The part at which the saphena vein enters.

Plate B 3 b.

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PLATE B. 4.

Aneurism of the Femoral Artery just below the bifurcation of the deep-seated Femoral Branch.

- a.* Poupart's ligament.
- b.* External abdominal ring.
- c.* Spermatic cord.
- d.* Epigastric artery.
- e.* Circumflex iliac artery.
- f.* Femoral artery.
- g.* Deep seated femoral artery.
- i.* The aneurismal tumour.

The common femoral artery is a continuation of the external iliac, where it runs without the fallopian ligament, in the groin, taking a course obliquely downwards and inwards.* It is situated between the inner edge of the sartorius and the anterior surface of the adductor brevis; but about four inches below Poupart's ligament, the sartorius crosses it.

* A line drawn from the centre of Poupart's ligament to the inner edge of the patella, will be nearly parallel to the course of the femoral artery.

In this part of its course, the crural nerve is situated to the outer side of the artery, and the vein to the inner side.

The artery and vein are inclosed in a sheath, formed by the deep layer of the crural aponeurosis. Some lymphatic glands, and a considerable quantity of fatty cellular tissue separate the artery from the anterior layer of the aponeurosis of the fascia lata and the integuments. The pulsations, however, of this vessel may generally be felt by putting the finger into a triangular depression, situated at the superior anterior and internal part of the thigh.

Posteriorly, this vessel rests on the pectineus adductores longus and brevis; from which it is separated by a thick layer of fat. Externally, it is in relation with the tendons of the psoas and iliacus muscles; and internally, with the pectineus.

After passing beneath the sartorius, the femoral artery turns backwards, and towards the lower third of the thigh, (about five inches above the inner condyle of the femur), passes between the two bundles, which terminate, inferiorly, the adductor magnus. The aponeurotic sheath, which surrounds it, becomes considerably thicker towards this point; and is strengthened by processes, which extend from the extensors of the leg to the adductors. When the artery has passed through the tendon of the adductor magnus, and reached the posterior surface of the thigh, it assumes the name of popliteal. The femoral artery, in the superior third of the thigh,

sends off four branches, viz:—external pudic artery, superficial epigastric artery, superficial circumflexa iliac artery, and the profunda femoris. Besides these four branches, the femoral artery, in the superior third of the thigh, sends off several small and unnamed branches to the sartorius, iliacus, pectinæus, and adductor muscles, and to the surrounding cellular tissue. In the middle third of the thigh the femoral artery gives off several branches to the muscles which surround it; and as it is about to become the popliteal artery it gives off a long branch, which descends to the inner side of the knee joint, named *arteria anastomotica magna*.

PLATE B. 4. *a.*

Femoral Aneurism.

Situated in the lower part of the thigh, in the vicinity of the place where the femoral artery descends into the cavity of the ham.

- a.* Sac of the aneurismal tumour.
- b.* Popliteal aneurism.
- c.* Superficial femoral artery.
- d.* Portion of the popliteal artery, between the two aneurisms.
- e.* Continuation of popliteal artery.
- f. f. f. f.* The external cellular sheath of the femoral and popliteal arteries, which contributed to the formation of both aneurismal sacs.
- g. g. g. g.* Portions of the femoral and popliteal arteries covered by their proper muscular coat.

Plate B & a



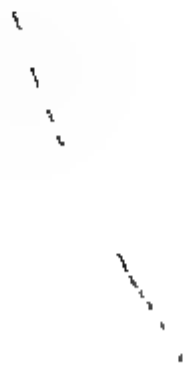
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Plate B 4 b.



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PLATE B. 4. *b*.

The mode of securing the Femoral Artery in the Operation for Popliteal Aneurism.

- a.* Integuments.
- b.* Sartorius muscle.
- c.* The sheath opened.
- d.* The nervus saphenus.
- e.* Femoral vein.
- f.* Femoral artery.
- g.* The artery firmly secured by the ligature.
- h.* The forceps holding up a portion of the sheath.
- i.* The thumb firmly pressing to one side the muscles.

Operation.—The patient is placed upon a table of convenient height, in the recumbent posture, with his shoulders a little elevated, and his leg slightly bent, to relax the sartorius muscle.

The incision is to be three inches long, rather above the middle of the thigh, in the oblique direction* of the sartorius, and on its inner edge. The

* Let the surgeon observe the course of the sartorius muscle.—For this purpose he may place the end of a cord on the superior

integuments being divided, the saphena vein will, in all probability, be found to run in the very line of the incision ; it being protected, the superficial and fascia lata are next to be cut through to the same extent as the skin ; the sartorius muscle will be then perceived, and is to be drawn gently to the internal side of the wound by a broad curved retractor, to allow the surgeon to divide a thin fascia that is subjacent to it, derived from the fascia lata, by which the vastus internus muscle is covered. It will then be necessary for him to cut through the dense fascia that passes from the vastus to the triceps magnus muscle, upon a director, when the sheath of the vessel will be exposed. It being opened, and the artery separated from the vein* and saphenus nerve, the aneurismal needle is to be cautiously insinuated between the vein and artery, directing it from within, outwards.

spinous process of the os ilii, and lay it along the inside of the thigh, until it reaches the back part of the inner condyle of the thigh bone. Draw a line from the centre, betwixt the spinous process of the os ilii and the crest of the os pubis, directly down the fore part of the thigh, until it touches the line of the sartorius. Let the point where these lines touch be the centre of the incision, and the direction of it in the line of the artery. Let the length of the incision be according to the depth of the integuments.

* The vein is situated behind, and the nerve on the anterior and external part of the artery.

Plate B.5



W. Cocks

PLATE B. 5.

A large Subclavian Aneurism.

The Subclavian Arteries.

They are situated upon the superior part of the thorax, and lateral and inferior parts of the neck. At their origin they present some differences on the right and left, which it is of importance to observe.

The right subclavian is the thickest, shortest, and most superficial; it arises from the arteria innominata, opposite to the posterior and external part of the sterno-clavicular articulation. Its anterior surface is covered by the phrenic nerve, by pretty numerous filaments of the great sympathetic, and by the par vagum: all these nerves touch the artery, and cross it nearly at right angles. It is next covered by the subclavian vein, which passes a little beyond it during inspiration in the omo-clavicular triangle; then by the internal jugular, which, as it is about to terminate in the preceding, is separated from the carotid by a small triangular space, in which we observe the artery under consideration,

the thumb from without, inwards; from above, downwards; and from before, backwards; on account of the rib being inclined downwards, and a little outwards.

The subclavian vein, of each side, is at first separated from the fore part of the artery by the scalenus anticus; afterwards it approximates it, then becomes immediately applied upon this vessel; and at length, as it passes under the clavicle, it becomes quite internal, or inferior to the artery. Anteriorly, it is covered by the origin of the sterno-thyroideus, the clavicle, and then by the subclavius muscle. Its inferior side rests upon the first rib, the costo-clavicular ligament, and the superior surface of the subclavius muscle. Superiorly, the subclavian vein is covered only by some cellular tissue, by different veins terminating in it, by the aponeurosis, and the fibres of the platysma; lastly, by the skin.

Plate H 6a.



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W^o Cocks

PLATE B. 5. *a*.

The cellular tissue and fascia covering the aneurismal tumour, as well as the sac, slit open, and the coagula removed so as to expose the ruptured part of the subclavian artery.

- a. a.* External surface of the tumour.
- b. b.* Integuments.
- c.* The aneurismal sac.
- d.* The inner surface of the aneurismal sac.

PLATE B. 5. *b*.

This sketch represents aneurism of the temporal artery.

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Plate B 6 f



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PLATE B. 6. *f*.

*Surgical Anatomy of the Vessels and Nerves on the Right side of the Neck.**

- a.* Arteria innominata.
- b.* Right subclavian artery.
- c.* Posterior scapular artery.
- d.* Carotid artery.
- e.* Internal jugular vein.
- f.* Termination of the subclavian vein.
- g.* The external jugular vein reflected and drawn down with the integuments.
- h.* Acromio-clavicular, or principal vein of the shoulder.
- 1. Nerves of the brachial plexus.
- 2. Phrenic nerve.
- 3. Supra-clavicular branch of the cervical plexus.

* In order that the objects represented in this and the following figure may be fully comprehended, it is necessary to remark that the shoulder is firmly depressed, in order to place in view the subclavian vessels; and that all the parts are in the position which is given them when about to practice the ligature of the subclavian artery.

- 4. Spinal nerve confounded with a branch of the cervical plexus.
- k.* Scalenus anticus muscle.
- l. l.* Scalenus posticus, formed of two bundles.
- m.* Small anormal muscle, forming an arch, fixed by its two extremities to the clavicle.
- n.* Mastoid muscle.
- o. o.* Omo-hyoid muscle.
- p.* Section of the clavicular portion of the trapezius muscle.
- q.* Levator anguli scapulæ.
- r.* Integuments.
- s.* Lobe of the ear.

Plate B6a

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PLATE B. 6. g.

The mode of Securing the Subclavian Artery.

- a.* The subclavian artery is considerably raised from its natural situation by means of the ligature which is passed under it.
 - 1. Nerves of the brachial plexus.
- b. b.* Acromio-clavicular, or principal vein of the shoulder.
 - 2. Supra-clavicular branch of the cervical plexus.
- c.* Scalenus posticus muscle.
- d.* The edge of the scalenus anticus muscle.
- e. e.* Integuments, platisma, and fascia of the neck.
- f.* A blunt hook keeping the integuments on the superior part of the wound back from the raised artery.
- g. g.* A ligature passed under the subclavian artery, between the origin of the internal mammary, vertebral, and ascending cervical branches, on the one part, and the internal border of the scalenus anticus on the other.

Operation of Tying the Subclavian Artery below the Clavicle.—The patient should be placed on a low

PLATE B. 6. *h.*

In this figure the arm is slightly removed from the trunk. The skin, the sub-cutaneous layers, the cellular tissue, and lymphatic glands are removed.

- a.* Portion of the internal face of the arm.
- b.* Hairs in the axilla.
- c. c. c.* Limits of the region.
- d. d.* Flaps of the pectoralis major muscle, one externally, upon the fore part of the deltoid; the other internally and inferiorly, upon the chest.
- e.* The pectoralis minor muscle.
- f.* Anterior portion of the deltoid muscle.
- g.* Subclavius muscle.
- h.* Coraco-brachialis muscle.
- i.* Lateral portion of the thorax.
- k.* Anterior part of the clavicle.
- l.* Coraco-clavicular aponeurosis covering the subclavius muscle. We only see here the internal and superior portion of this aponeurosis, the rest having been removed in order to expose the vessels and nerves to view.

Plate B 6 h

N^o Cocks del

- m.* A ligature raising the axillary artery at the place where we should apply the ligature upon the vessel in the clavi-pectoral triangle.
- n. n.* Axillary vein.
- o. o.* Cephalic.
- p. p.* Axillary artery.
- q. q. q.* Median nerve and its two roots, which embrace the artery.
- r. r.* Musculo-cutaneous nerve, running along the internal border of the coraco-brachialis muscle, from which a slice has been removed parallel to the fleshy fibres, in order to give a better view of the nervous cord.
- s. s.* The ulnar nerve still very close to the artery.
- t. t.* Internal cutaneous, separated from the preceding by the axillary vein.
- u.* Posterior thoracic nerve, concealed in great part by the shadow in the bottom of the cavity, and applied upon the serratus magnus anticus muscle.
- v. v.* Brachial branches of the intercostal nerves.
- w. w. w.* Acromial artery, originating from the axillary, behind the pectoralis minor, and being discovered only upon the fore part of the vein.
- x.* Coraco-acromion ligament, sliding under the deltoid muscle.

- y.* Coraco-acromion triangle.**
- z.* Small arterial and venous branches of the hollow of the axilla.**
- 1. Head of the humerus.**
- c. c. y.* Clavi-pectoral triangle, limited by the pectoral muscle below, and by the clavicle above.**
- x. y. y.* Coraco-acromion triangle, limited by the coraco-clavicular and coraco-acromion ligaments.**
- x. c. c. c.* Sub-pectoral triangle, circumscribed by the humerus externally, the pectoralis minor muscle superiorly, and the anterior margin of the axilla inferiorly.**

Plate B 6 v.

W^o Cocke

PLATE B. 6. i.

Arteries, Veins, and Nerves of the Arm.

1. The ulnar nerve.
2. Spiral nerve.
3. Median nerve.
4. Internal cutaneous nerve.
5. Intercosto-humeral nerve.
- a.* Humeral artery.
- b.* Humeral vein.
- d.* Deltoid muscle.
- e.* Biceps.
- f.f.* Triceps.
- g.* Basilic vein.
- h.* Cephalic vein.

The Humeral Artery.

The axillary artery is first known by the name of humeral or brachial, where it proceeds from the axilla to the internal side of the arm.

Having left the cavity of the axilla, and passed to the internal surface of the tendon of the teres major, it continues its course above the internal brachial to the inner side of the biceps, and gradually runs

along the middle of the arm to the anterior surface of its extremity, where at last concealed under the aponeurosis of the biceps, it divides near the bend of the fore arm into the ulnar and radius. The artery gives origin to irregular muscular branches, which are named profunda superior, profunda inferior, and anastomoticus magnus; there are, however, many branches arising from it equal in magnitude to these.

NOTE.—The humeral artery does not run a perfectly straight course down the arm. When the subject is laid on its back, the arm by the side, and the palm of the hand flat upon the table, if we push a point horizontally under the arm-bone, one hand's breadth from its head, the artery escapes. When in the same horizontal direction, two hands' breadth from the head of the bone, the artery is transfixed.



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PLATE B. 6. *k*.

This figure represents the fold of the arm in such a manner as to show the disposition of the organs which may be concerned in the operation of venesection.

- a.* Trunk of the basilic vein in the internal bicipital groove.
- b.* Cephalic vein on the external side of the biceps, and separated from the musculo-cutaneous nerve by the aponeurosis.
- c. c.* Basilic and cephalic veins of the fore arm, or anterior radial and ulnar branches.
- d.* A probe placed under the humeral artery, above the fibrous bandelet of the biceps.
- e.* Common median vein, which communicates with the deep veins in passing before the aponeurotic aperture, and which afterwards divides, in order to form the median basilic and median cephalic.
- f.* Posterior ulnar vein.
- g.* Posterior radial.
- h.* Trunk of the internal cutaneous nerve, placed on the inner side of the basilic vein.

- i.* Musculo-cutaneous nerve, distributing itself especially around the common median vein.
- k.* Aponeurotic bandelet, which is detached from the bicipital tendon in order to pass upon the fore part of the internal muscular mass.
- l.* Tendon of the biceps muscle.
- m. m. m. m.* Circumferences of the aponeurotic aperture of the elbow,—strong and distinct internally, thin and blending itself, externally, with the cellular tissue which covers the external muscular mass.
- n.* Brachial artery.
- o.* Radial artery.
- p.* Ulnar artery.
- q.* Median nerve.
- r. r.* Brachial vein.—These last two organs, here separated from the artery by the probe, rest upon the brachialis internus muscle before insinuating themselves between the fibrous bandelet of the biceps and the tendon of this muscle.
- s. u. u.* External muscular mass.
- t. t. t.* Internal muscular mass, covered in great part by the aponeurosis.
- v.* Internal eminence of the elbow.
- w.* Hook which draws inwards the aponeurotic aperture, in order to expose to

view, above the bandelet of the biceps, the brachial artery and vein, the median nerve, the brachialis internus, and pronator teres muscles.

x. x. Subcutaneous layer and portion of the reflected skin.

y. Fore arm, covered by its integuments.

z. Inferior part of the arm, likewise covered by the skin.

The Radial Artery,

Is generally smaller than the ulnar, and lies pretty deep at first, but rises a little as it passes outwards and forwards, under the supinator longus, in order to follow the middle furrow of the fore arm.

This artery, consequently, becomes more and more superficial as it descends; so that immediately below its origin it corresponds to the aponeurotic aperture, and is only separated from the radius by the supinator brevis, the tendon of the biceps, and some cellular tissue. Anteriorly, it is separated from the integuments by several fibro-cellular laminæ, and the superficial layer. Below the aponeurotic aperture the radial artery is placed upon the pronator teres, between two thin fibrous laminæ, having on its inner side the flexor carpi radialis, on its outer, the supinator longus, the internal margin of which usually advances some lines before it.

Operation of tying the Radial Artery near the Wrist.
—Make an incision about two inches in length,

following the direction of a line, which going from the styloid process of the radius, would pass between the condyles of the humerus. We find the artery superficially situated on the inner side of the supinator radii longus ; we raise it with a grooved director, and tie it.

The Ulnar Artery.

Immediately after it separates from the radial it dips under the internal muscular eminence, traverses the pronator teres, runs obliquely downwards and a little inwards, and places itself between the flexor sublimis and profundus.

The ulnar artery is accompanied by two veins, lying on each side in its entire extent ; and by the ulnar nerve, lying to its ulnar border for the lower two-thirds of its course.

Operation of tying the Ulnar Artery.—Feel for the pisiforme bone,—half an inch above which, and on the outer side of the flexor carpi ulnaris muscle, make a straight incision of two inches in extent through the integuments ; cut through the fascia, an assistant drawing the internal edge of the wound to the inner side ; dissect carefully by the side of the tendon, and you will find the artery situated on the outer side of the nerve.

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W. Cocke

PLATE B. 6. 1.

The mode of applying a ligature around the humeral artery, above the bend of the arm:

- a. a.* Integuments.
- b.* The edge of the biceps muscle.
- c.* The sheath covering the vessels.
- d.* The median nerve.
- e.* Humeral artery.
- f.* Vein lying under the artery.
- g.* Internal cutaneous nerve.
- h.* The ligature passed around the artery.
- i.* The sheath divided and held up with the forceps.
- k.* Blunt hooks, by means of which the edges of the wound are kept asunder.

Operation.—Begin the incision half an inch above the inner condyle of the os humeri, continue it upwards along the inner edge of the biceps muscle, for at least two inches; when, having cut through the integuments and generally a little fat, you find the

median nerve rising before the artery, which has an accompanying vein on each side. Pass the ligature beneath the vessel from its inner side, by which means the nerve is readily excluded.

NOTE.—To find the humeral artery before passing over the elbow-joint, we make the patient bend the other arm against a force, to shew the expansion of the biceps. Having marked its place, we refer it to the diseased arm, and make an incision along the inner edge of the biceps ; or rather, we might say, just where it begins to throw off its tendinous expansion ; that is, two fingers' breadth from the inner condyle of the os humeri.

Plate Bbm



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PLATE B. 6. *m.*

This sketch represents an aneurism by anastomosis in an aged countryman ; where the tumour, beginning in the face and spreading over the cheek, had attained to the very unusual height of two inches above the surface without pulsation, but with frequent hæmorrhage.

PLATE B. 6. *n*.

This sketch represents varicose aneurism at the bifurcation of the abdominal aorta.

- a*. Aorta.
- b*. Vena cava.
- c*. Aneurism.
- d*. Part of the vein which communicated with the aneurism.*

* Immediately above the bifurcation of the vena cava there was a round aperture, somewhat larger than a sixpence, which afforded a free entrance into it from the aneurism.

Plate B 6 n

Cooks del

Fig 1.

Plate D. 5.



WP Cocks

PLATE D. 5.

Bandages for the Nose and Lower Jaw.

Fig. 1.

Shews the method of applying the sling for the nose.

- a.* The aperture in the middle of the bandage, which intercepts the orbiculus of the nose.
- b.b.* The two upper heads, which, being carried round the temples and occiput, are tied upon the forehead *c.c.* by the knot *d.*
- e.e. f.f. g.g.* Denotes the same with respect to its two lower heads.

Fig. 2.

Bandage for the lower jaw.

- a. b.* The circular turn about the head by which the bandage begins to be applied.
- b.* The place where the two rounds intersecting each other are sewed together, and then passing under the jaw in the course *c. d. e.*, it is turned a few times round the chin and occiput, *f. g.*

PLATE D. 6.

Bandages for the Under Jaw and Lip.

Fig. 1.

Denotes the double bridle, which is made with a two-headed roller, whose middle is first applied under the chin, passing on each side in the direction *a. b.* to the top of the head *c.*—the same course is repeated several times, and then it is passed round about the neck and chin, so as to invest the lower jaw, upon the middle of which its heads cross at *e*, and being carried to the occiput, they pass from thence and terminate, circularly, about the temples and forehead, *f.f. b.*

Fig. 2.

The method of applying the bandage to the upper lips.

- a.* Its middle, which is not slit.
- b.b.* Its two upper heads, which are tied upon the forehead at *c.*
- d.d.* Its lower heads, which being carried up over the cheeks, *e.e.*, are crossed upon the occiput, and then fastened by a knot upon the forehead.

Fig. 2

Fig 1

Fig 2

PLATE D. 7.

The dividing Bandage, viewed on the fore part of the body.

- a.a.* The circular turns investing the head, where it begins.
- b. c.* The turns which pass under the right and left axilla to the back, where the roller heads change hands, and are then conveyed, circularly, about the thorax, *d.d.*

Fig. 1.

Represents a posterior view of the same bandage.

- a.* The place where the roller heads traverse each other like an X.
- b. c.* The turns which go under each axilla.
- d. d.* The circular rounds which invest the thorax, and change their courses upon the back.

PLATE D. 8.

Bandages for the Chest.

Fig. 1.

Bandage for a fracture, or dislocation of the clavicle, which is made of the double headed roller.

a. b. The first progress of its anterior head.

c. d. e. The circular rounds about the thorax, made by its posterior head, which, riding over the former, binds it down tight, before it is reflected back in the series *f. g. h.*

Fig. 2.

Bandage for the clavicles and scapulæ. It may begin under the axilla *a.*, and forming its first course *a. d.* over the left shoulder, and under the same axilla *c.*, then traverses its first course at *e.*, and, passing over the left shoulder *d.*, passes again under the same axilla at *a.*, and so on as before. You may also begin this bandage above either of the shoulders at *b.* or *d.*, as well as under the axilla *a. c.*

Fig 1



Fig 2.



W. C. C. S.

ANATOMY OF THE MALE AND FEMALE ORGANS OF GENERATION.

THE male organs are composed of the penis, testicles, and vesiculæ seminales.

The *Penis*.—Its upper part and sides are formed by the corpora cavernosa, and its under part by the corpus spongiosum.

The *Corpora Cavernosa* — are united together throughout their whole length. Externally and laterally they are rounded. Behind, they terminate in two conical processes termed crura penis, and which are about two inches in length. The crura penis separate like the branches of the letter Y, and are attached to the inner border of the ramus of the ischium and pubes on each side. These attachments extend from the front and under part of the symphysis pubis, almost to the tuberosities of the ischia.

The *Corpus Spongiosum*—begins before the prostate gland, and surrounds the urethra. It begins at the bulbous part of the urethra, and then proceeds forwards in the space between the two corpora cavernosa, on the under surface; and is expanded, at the extremity of the penis, into a very vascular sub-

stance, called glans penis, naturally covered by a fold of skin, called the prepuce; which, at the under part of the gland is fixed to it by a frænum.

The *Urethra*—is from nine to twelve inches long, extends from the neck of the bladder to the extremity of the penis. It is bent several times in the course of its length, and has a large capacity, which much exceeds that of all the other excretory ducts.

In the urethra are to be observed—

- 1st.—The verumontanum or caput gallinaginis; a cutaneous eminence in the urethra, about an inch before the neck of the bladder.
- 2nd.—The openings of the ejaculatory ducts around the caput gallinaginis.
- 3rd.—The opening of the ducts of the prostate and Cowper's glands.
- 4th.—The lacunæ, or openings of the ducts of the mucous glands of the urethra.

Testes.

The testes are two flattened oval bodies originally situated within the cavity of the abdomen, but descend about the time of birth into the scrotum.

The parenchyma of the testicles consists of an infinite number of small convoluted vessels, which are denominated seminiferous, and are all directed towards one point of the surface, called the head of the epididymis. At this position they run together, anastomose, diminish in number, and terminate by forming one cylindrical canal, which lies convoluted

on the testis, and now takes the name of epididymis. It is soon detached from the organ under the name of vas deferens. It ascends towards the inguinal ring, plunges into the pelvis, and very soon arrives at the inferior and anterior part of the bladder: there it communicates both with the vesiculæ seminales and the prostatic portion of the urethra.

The body of the testicle is enveloped by a strong, dense and fibrous membrane, termed the tunica albuginea.

The next covering of the testicle is the tunica vaginalis, which forms a delicate membranous bag, connected externally by cellular membrane to the dartos: and the testicle, with its tunica albuginea, adheres firmly to its outside, pushing itself, as it were, into it.

The *Spermatic Arteries*—arise immediately below the renal, from the fore part of the aorta, at a very acute angle; they pursue a very tortuous course downwards and outwards, accompanied by one or two veins and by several small nerves, which descend from the renal plexus and from the sympathetic nerve.

Each spermatic artery passes obliquely across the psoas muscle and the ureter, and descends on the external side of this vessel. The right spermatic artery crosses the vena cava also.

The spermatic arteries, in the male subject, incline more outwardly in their descent than in the female; and arriving at the internal abdominal ring, each

joins the vas deferens, and descends, forming a part of the spermatic cord to the testicle.

Veins.—The blood of the spermatic arteries is returned by a number of small veins from the testicles, which enlarge as they pass up the cord. Having passed through the abdominal ring, they form a plexus around the spermatic artery, to which the term corpus pampiniforme is given.

The *Vesiculæ Seminales*—are two whitish membranous receptacles, placed along the base of the bladder, and extended obliquely from the ureters to the base of the prostate gland.* They converge anteriorly and diverge behind, so as to include between them an angular space, in which the bladder rests immediately on the rectum. Each vesicula is convoluted, making it appear much shorter than it really is; and consists of two lamellæ: the exterior one being dense and firm, whilst the internal is in every respect similar to mucous membrane, and thrown into folds, so as to divide the cavity into cells. The anterior extremity of the vesicula ends in a narrow tube, which unites with the vas deferens, forming a common duct (*ductus ejaculatorius*). This will be found to run obliquely forwards, lying in the fissure between the middle and lateral lobe of the prostate, then between the latter and the mucous membrane, which it pierces at the side of the verumontanum.

* Their breadth is not more than three or four lines, their length two inches.

Female Organs of Generation.

The female organs of generation are divided into external and internal.

The external parts are—the mons veneris, the labia majora, the clitoris, the labia minora or nymphæ, the meatus urinarius, and Hymen.

The *Mons Veneris*—the prominent portion of integuments immediately over the ossa pubis. It is formed by a quantity of fat under the skin; and after puberty, is covered with a short hair.

The *Labia Majora vel Pudendi*—are two membranous folds, thicker above than below, whose length is much about the same in all women, but whose volume and projection are in the direct ratio of the degree of fatness of the individual. Their outer surface is contiguous to the upper and inner part of the thighs, and is furnished with a few hairs. It is formed by a prolongation of the skin, beneath which there is found a considerable number of sebaceous follicles. Their inner surfaces are covered with a beautifully fine and sensible membrane, of a florid colour in young females, from the surface of which is constantly secreted a fluid for the especial protection of these parts against adhesion.

The *Clitoris*—is placed below the anterior angle of the pudendum, and arises by two crura from the upper part of the rami of the ischia. The external part or extremity of the clitoris is called the glans,

which has a prepuce or thin covering, to which the nymphæ are subjoined.

The *Labia Minora* or *Nymphæ* — are two small spongy bodies or doubling of the skin, rising from the extremities of the prepuce of the clitoris; less in size and of a more delicate texture, but resembling in their form the labia. They pass on each side of the pudendum, within the labia, to about half its length, when they are gradually diminished till they disappear.

The *Meatus Urinarius* — is situated immediately under the clitoris, and between the inferior extremities of the nymphæ. It is not more than an inch in length, but its diameter is greater and more dilatable than in the male. Its direction is obliquely downwards and forwards, at the same time slightly curved, the concavity being directed upwards towards the pubic symphysis.

The *Hymen*.—In the virgin state, the orifice of the os externum is almost always partially occluded by a membranous expansion called the Hymen. This expansion is of a semilunar shape, and situated immediately within the orifice of the vagina, behind the meatus urinarius. When lacerated, it forms several fleshy excrescences, which are called *carunculæ myrtiformes*.* It is almost constantly pierced

* The *carunculæ myrtiformes* are small reddish tubercles, rounded or flattened, and more or less prominent; which are only observed in women who have lost their virginity.

by a hole, which gives issue to the menstruous secretion ; when it is not, it gives occasion to such an accumulation of this fluid as to produce great pain, and require for the most part the interference of art.

Of the internal parts we shall only describe the vagina, uterus, and ovaria.

The *Vagina*, or *Os Externum*,—is found below the orifice of the urethra, and almost immediately under the symphysis of the pubis. It is an elastic membranous, cylindrical canal, compressed from before backwards, placed in the interior of the pelvis, between the bladder and rectum ; opening inferiorly at the middle of the vulva, and embracing, superiorly, the neck of the uterus.*

The *Uterus*†—is a spongy hollow receptacle, somewhat less than two inches in length, situated in the upper part of the pelvis, with the bladder before and the rectum behind it. In an adult woman it is contained within the pelvis, but in an infant it lies above it. It is divided into its fundus, body, and neck, with the enclosed cavity.

The *Ovaria*—are two compressed and irregular oval bodies,‡ somewhat granulated on the surface, and enclosed between the folds of the broad ligaments ; from the lower border of each descends a

* The vagina is from six to eight inches long.

† It resembles a flattened pear, and is nearly an inch in thickness

‡ About the size of a common nutmeg, flattened.

thin fibrous cord, which attaches it to the angle of the uterus, close behind the insertion of the fallopian tube. At puberty we may observe upon their surface, (if favourably placed between the eye and the light), a number of little vesicular bodies, of uncertain number,* which contain a fluid capable, it is said, of being coagulated,—these are the ova.†

* The number varies from twelve to twenty-four.

† First accurately described by De Graaf.

Plate E. 1.

W LOCK

PLATE E. 1.

This sketch represents the male organs of generation dissected.

1. Glans penis.
2. Corpus cavernosum penis.
3. Corpus spongiosum urethræ.
4. Integuments of the penis.
- * * The left crus of the penis separated from the ramus of the pubes.
5. Testicle.
6. Bulb of the urethra.
7. Cowper's gland.
8. Triangular ligament of the ossa pubis.
9. Compressor urethræ of the left side.
10. Prostate gland.
11. Vesicula seminales.
12. Ureter.
13. Bladder.
14. Rectum.
15. Sphincter ani.
16. Os pubis.
17. Membranous portion of the urethra.

PLATE E. 2.

Posterior View of the Bladder and Penis.

- a.* Bladder.
- b.* Peritoneal covering of the fundus of the bladder.
- c.* Left ureter.
- d.* Right ureter.
- e.* Left vas deferens.
- f.* Right vas deferens.
- g.* Right vesicula seminalis.
- h.* Left vesicula seminalis.
- i. i.* Prostate gland.
- k.* Membranous portion of the urethra.
- l.* Right crus of the penis.
- m.* Left crus of the penis.
- n.* Bulb of the urethra.



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Plate E 3.



W^d Cocks.

PLATE E. 3.

The External Parts of Generation in a Female.

- a.* Mons veneris.
- b.* Labium externum.
- c.* Superior commissure of the vagina.
- d.* Vagina.
- d.** Inferior commissure of the vagina.
- e.* Perineum.
- f.* Nymphæ.
- g.* Glans clitoridis.
- i.* Anus.
- k.* Meatus urinarius.
- l.* Hymen.

PLATE E. 4.

This plate represents a cast of the urethra and bladder, in which is seen the exact curve of the urethra from the part where it is a fixed canal to its termination in the bladder.

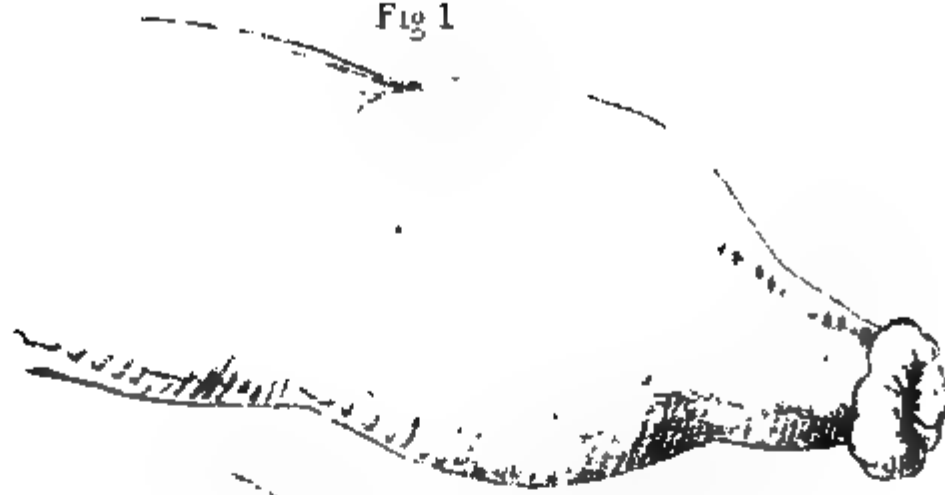
- a. a.* The cast of a portion of the bladder in its distended state.
- b. b.* The ureter of the right side terminating in the bladder.
- c.* The cast of the canal which passes over the prostate gland.
- d.* The membranous portion of the urethra.
- e.* The bulb of the urethra.
- f. f.* The canal of the urethra, leading to the external orifice, in the same situation respecting the bladder in which it is placed when the penis is in an erected state.

Plate E. 4



HP Cocks

Fig 1



P. 22



Figl

Fig 2

W^d Cocks



W. P. Cocks



Fig 2



Fig 1



ture, and the thickening of the bladder, are more strongly marked than in the preceding figure.

- a.* The urethra contracted to the extent of half an inch. The stricture is situated at the bulb, and felt as hard as cartilage.
- b.* Points out a contracted portion in the anterior part of the urethra, about three inches from the orifice, a common seat of stricture.
- c.* The urethra, behind the stricture, considerably dilated.
- d.* The external surface of the bladder.
- e.* The cut edge of the bladder, shewing the coats much thickened.
- f.* The prostate gland enlarged, and cartilaginous.

Plate E n

W COCKE.

PLATE E. 10.

Exhibits a striking example of complicated and extensive disease of the urethra, bladder, and prostate gland, not excepting even the rectum; the whole derived, in the first instance, from the throwing up of an injection to cure a gonorrhœa.

- a.* The orifice of the urethra and glans penis, upon the surface of which may be observed the depressions left by the chancres.
- b.* The commencement of the stricture that was the immediate consequence of inflammation of the urethra.
- c.* The termination of this contracted part, the extent of which is about two inches and a half.
- d.* A very fine silver probe, that was with difficulty passed through a firm and closely contracted stricture at the bulb of the urethra, and making its appearance behind the stricture, through the divided parts at
- e.* Where the canal might have been brought more into view, but for this objection:—that the whole of the disease could not in any

way be distinctly seen at once, and consequently the other appearances preserved upon the figure would have been partially sacrificed by any further prosecution of the dissection.

- f.* The urinary bladder; its parietes excessively thickened from habitual labour, and its cavity rendered smaller in the same proportion.
- g.* The orifice of one of the fistulous canals, many of which were found passing from the urethra, in various directions.
- h.* The double opening from two fistulous passages running into the body of the left corpus cavernosum penis.
- i. i.* The cavity of an extensive abscess, formed in consequence of irritation and disease in the prostate gland.
- k. k.* Small rounded calculi, with highly polished surfaces; many of which were in this case found deposited in little recesses or cells around the cavity of the large abscess in the prostate gland.
- l.* A small abscess, that was accidentally divided into at the fundus of the bladder, between the external laminæ of its muscular coat.
- m.* A part of the anterior surface of the rectum, closely adherent to the diseased prostate gland.
- n.* A common probe, introduced by an ulcerated

opening in the coats of the intestine through the abscess in the prostate gland, thence passing out from the divided part of the urethra, at

- o.* Where the point of the probe makes its appearance immediately behind the stricture.

See page 1147 to 1161.

PLATE E. 11.

This drawing represents the urethra opened in two different places, one before the stricture, the other behind ; the one before, is through the body of the penis ; the other behind, is upon the anterior surface of the membranous part, and a bougie passes from the one opening to the other.

- a. a.* The crura penis, and bulbous part of the urethra, all blended together by inflammation and suppuration, which has taken place in many parts.
- b. b.* The prostate gland, in a diseased state.
- c. c.* The cut edges of the bladder.
- d.* The urethra behind the stricture, very much enlarged, irregular on the surface, in consequence of ulceration.
- e. e.* The cut surface of the corpus cavernosum penis.
- f. f.* The cut surface of the corpus spongiosum urethræ.
- g. g.* The bougie passing from the sound to the unsound part of the urethra.
- h.* A small bougie in the new passage.

See pages 1147 to 1161.

Plate E. II.

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W. P. Cocks.

Plate E. 12.

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W. Cocks

PLATE E. 12.

A false Passage, made by the improper use of the Bougie.

- a.* Glans penis.
- b.* Corpus spongiosum urethræ.
- c.* Corpora cavernosa.
- d.* The canal of the urethra slit open to shew the bougie in the false passage.
- e.* Natural passage of the urethra.
- f.f.* Integuments of the penis, with the divided portions of the corpus spongiosum thrown back.
- g.* Bougie.

PLATE E. 13.

This sketch represents the left lateral lobe of the prostate gland very much enlarged, and what is unusual, forms a prominent tumour in the bladder, by which the middle lobe is thrown towards the right side. From the mode in which the enlargement has taken place, the orifice of the bladder and urethra is enlarged to an uncommon degree, as is also a portion of the urethra itself; so that instead of being a canal, it has at this part the appearance of an oval cavity.

This is a very unusual appearance, and is principally produced by the left lobe, in its enlargement, having extended itself to the same length, in the direction of the membranous part of the urethra, as it has done towards the bladder in the opposite direction; and also in an equal degree, laterally, towards its opposite lobe; making that side convex, and the surface of the right lobe concave.

See page 995.

Plate E.13.

W. P. Cook

Plate E. 14.

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PLATE E. 14.

In this plate the middle lobe of the the prostate is not very prominent, but it extends laterally, and the transverse fold of the membrane of the bladder is unusually thick, so that they form together a very complete valve to the orifice of the urethra. The lateral portions of the gland are not much elongated, but are considerably swelled, so that the hollow between the middle lobe and the verumontanum is of unusual depth. The resistance to the passage of the urine was so great in this instance that not a drop could be passed; and the efforts of the muscular coats of the bladder to expel the contents were so great that they occasioned the inner membrane to protrude just between the openings of the ureters; and a large cavity or reservoir was formed there capable of containing about half a pint of urine, while the cavity of the bladder became preternaturally contracted. In this case every attempt

See pages 995 to 1000.

to pass an instrument into the bladder proved ineffectual.

- a.* The course of the false passage is marked by a bristle.
- b.* The point at which the catheter pierced the urethra, and went between it and the middle lobe of the prostate gland, and then entered the bladder (*c.*) just where the communication had been formed between that cavity and the cyst behind. (*d.*)

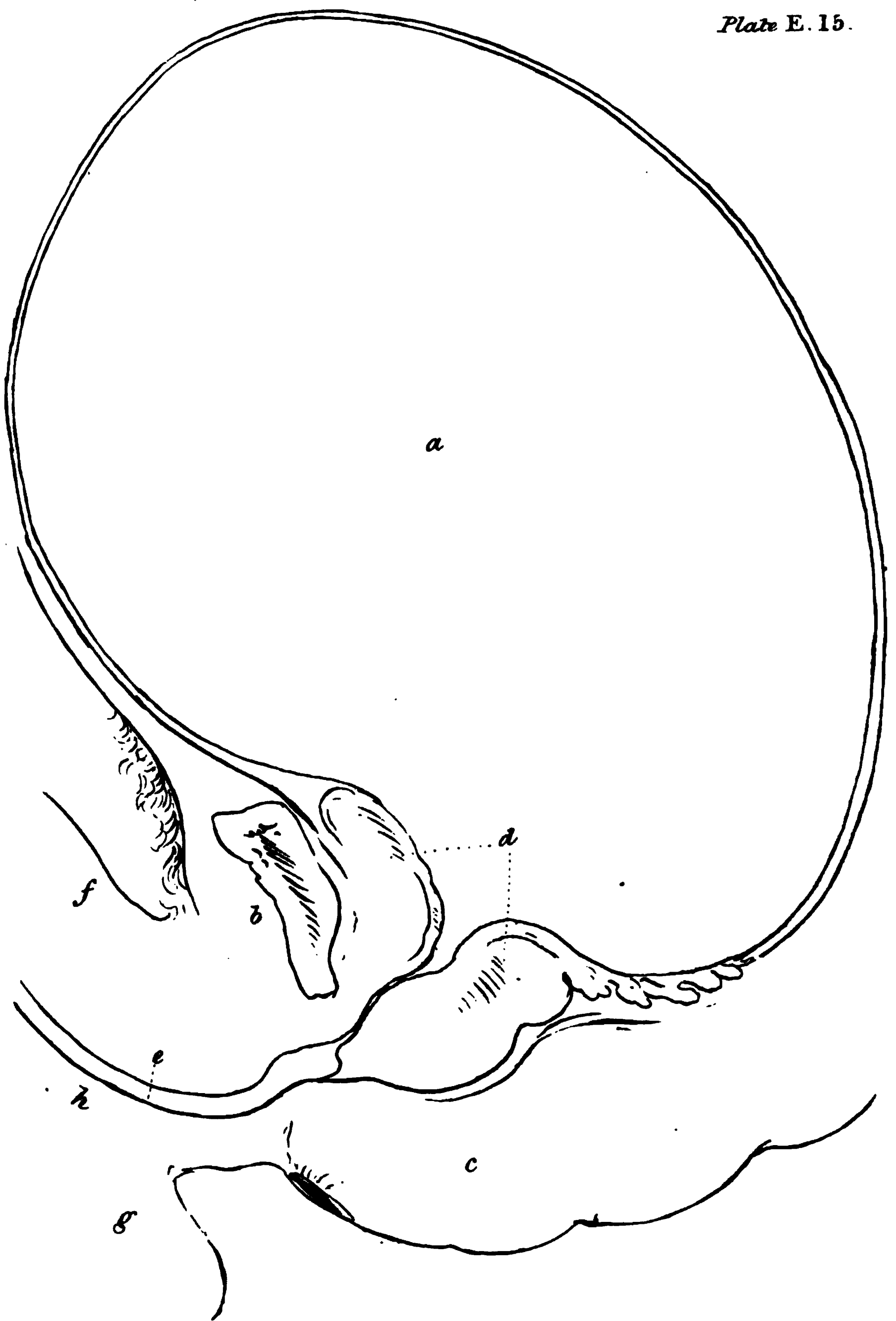


PLATE E. 15.

This diagram is intended to illustrate a distended bladder.

- a.* The bladder very much distended.
- b.* Os pubis.
- c.* The rectum.
- d.* The prostate gland.
- e.* The urethra.
- f.* The corpus cavernosum.
- g.* Part of the scrotum.
- h.* Corpus spongiosum urethræ.

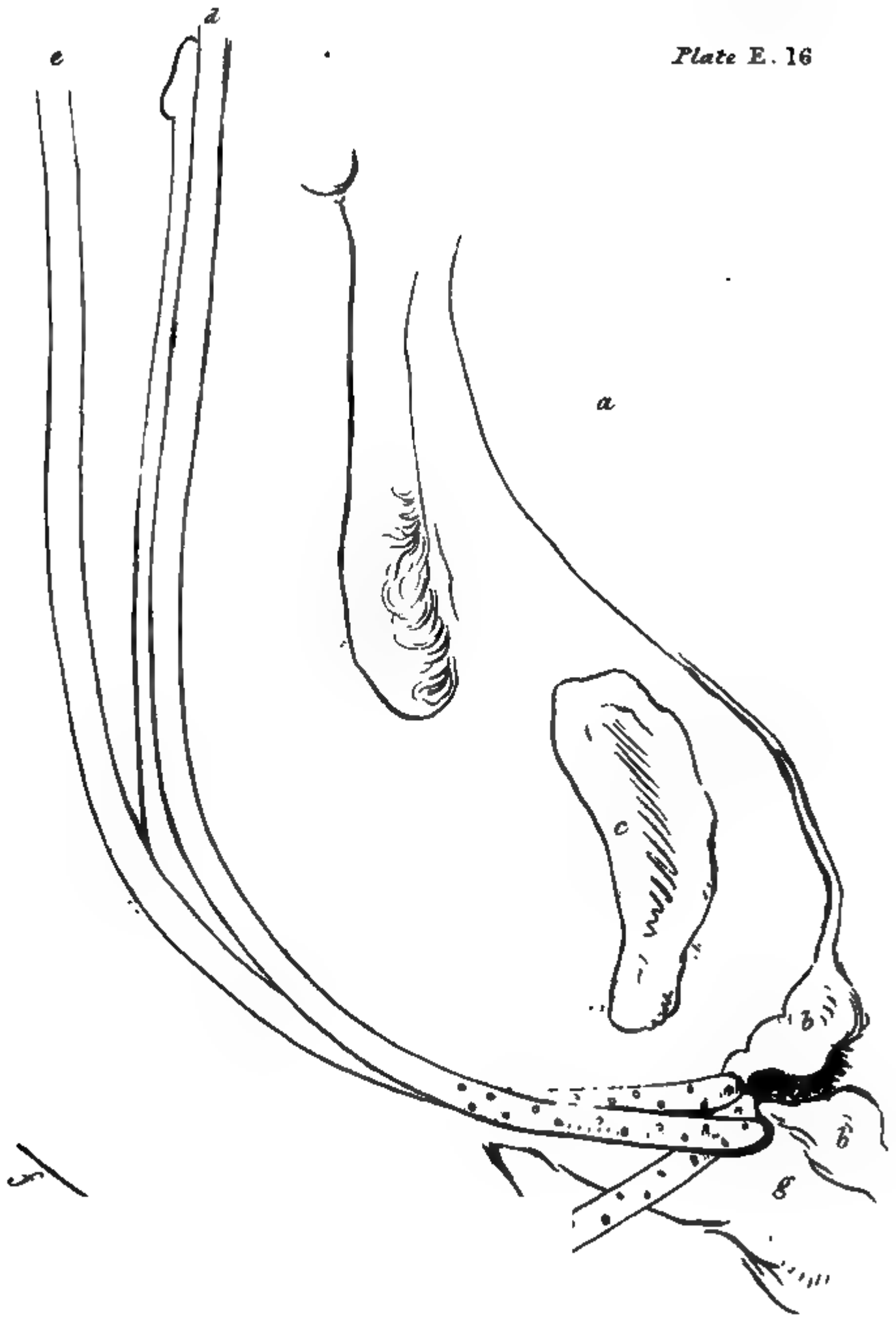
See page 226.

PLATE E. 16.

Represents the various movements of the catheter that are necessary to ensure its introduction into the bladder.

- a.* A portion of the bladder.**
- b. b.* The prostate gland.**
- c.* Os pubis.**
- d.* The catheter introduced into the urethra, but obstructed at (*g.*). The handle of the catheter is depressed, so that the instrument comes into the position of (*f.*), still the point remains.**
- e.* Is the position of the catheter when it is drawn up towards the pubes; when it is to be moved directly onwards, until it enters the neck of the bladder.**
- h.* The scrotum.**

See pages 349 to 355.



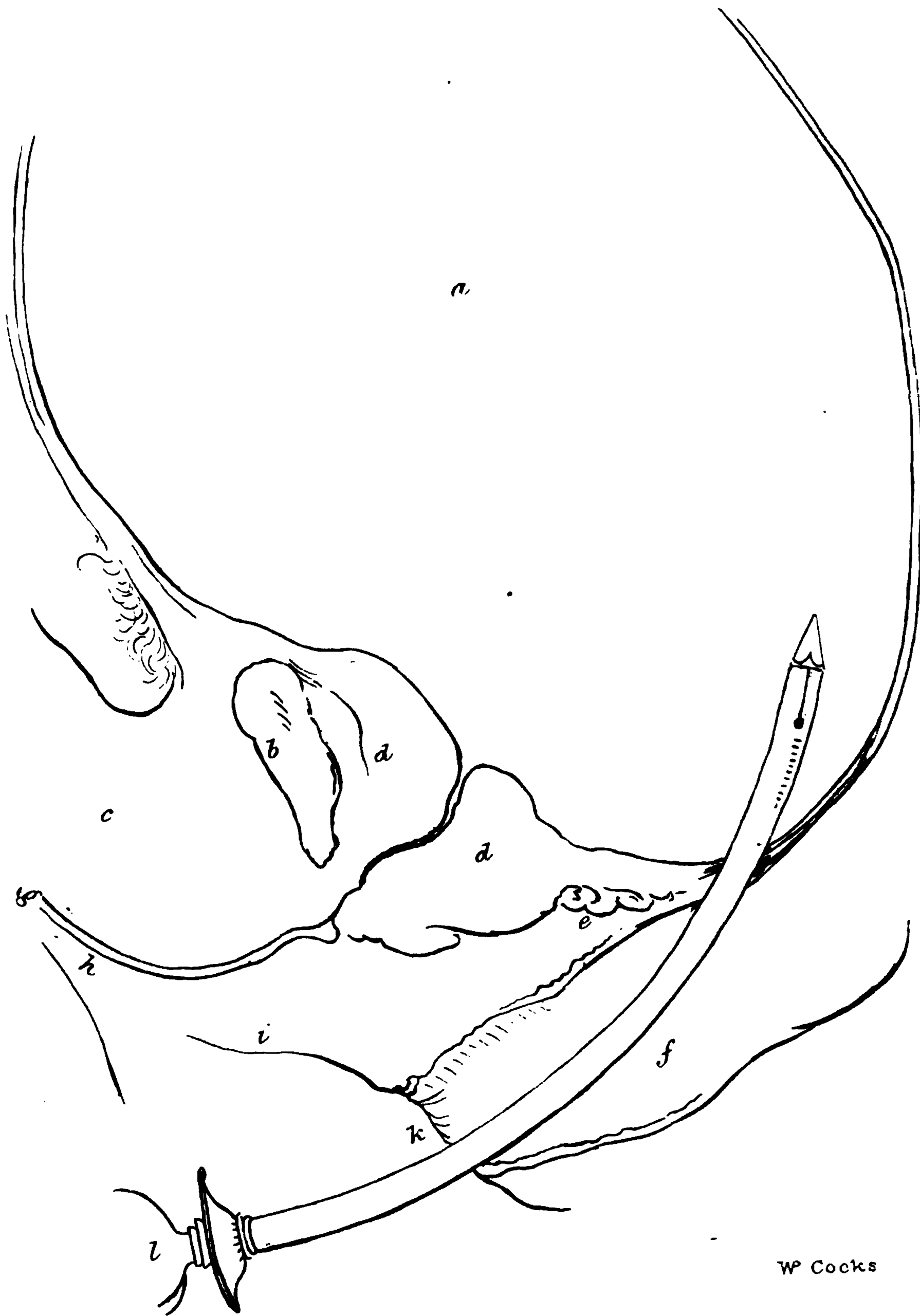


PLATE E. 17.

Puncturing the Bladder from the Rectum.

- a.* Distended bladder.
- b.* Os pubis.
- c.* Corpus cavernosum.
- d.* Enlarged prostate gland.
- e.* Vesicula seminalis.
- f.* Rectum.
- g.* Urethra.
- h.* Corpus spongiosum urethræ.
- i.* Perineum.
- k.* Anus.
- l.* The trocar penetrating the bladder from the rectum.
- m.* The obstructed portion of the urethra.

See page 220.

PLATE E. 18.

This plate represents the operation of sounding for stone in the bladder.

Fig. 1.

- a.* Bladder.
- c.* The stone.
- b.b.* Prostate gland.
- **c.* Urethra.
- d.* Vesicula seminalis.
- e.* Rectum.
- f.* Scrotum.
- g.* The sound.
- h.* Corpus cavernosum.
- i.* Corpus spongiosum urethræ.

Fig. 2.

- a.* The bladder.
- b.* Stone.*
- c.* Rectum.
- d.* The finger introduced into the rectum, to lift the stone from the lower part of the bladder.
- e.* Scrotum.
- f.* Corpus spongiosum urethræ.
- g.* Corpus cavernosum.
- h.* The sound.

* When the staff (*h.*) is introduced into the bladder, it may happen that the stone (*b.*) lodges under the level of the urethra, and of course of the sound, consequently we have to force or strike down the convex part of the sound.

See page 1038.

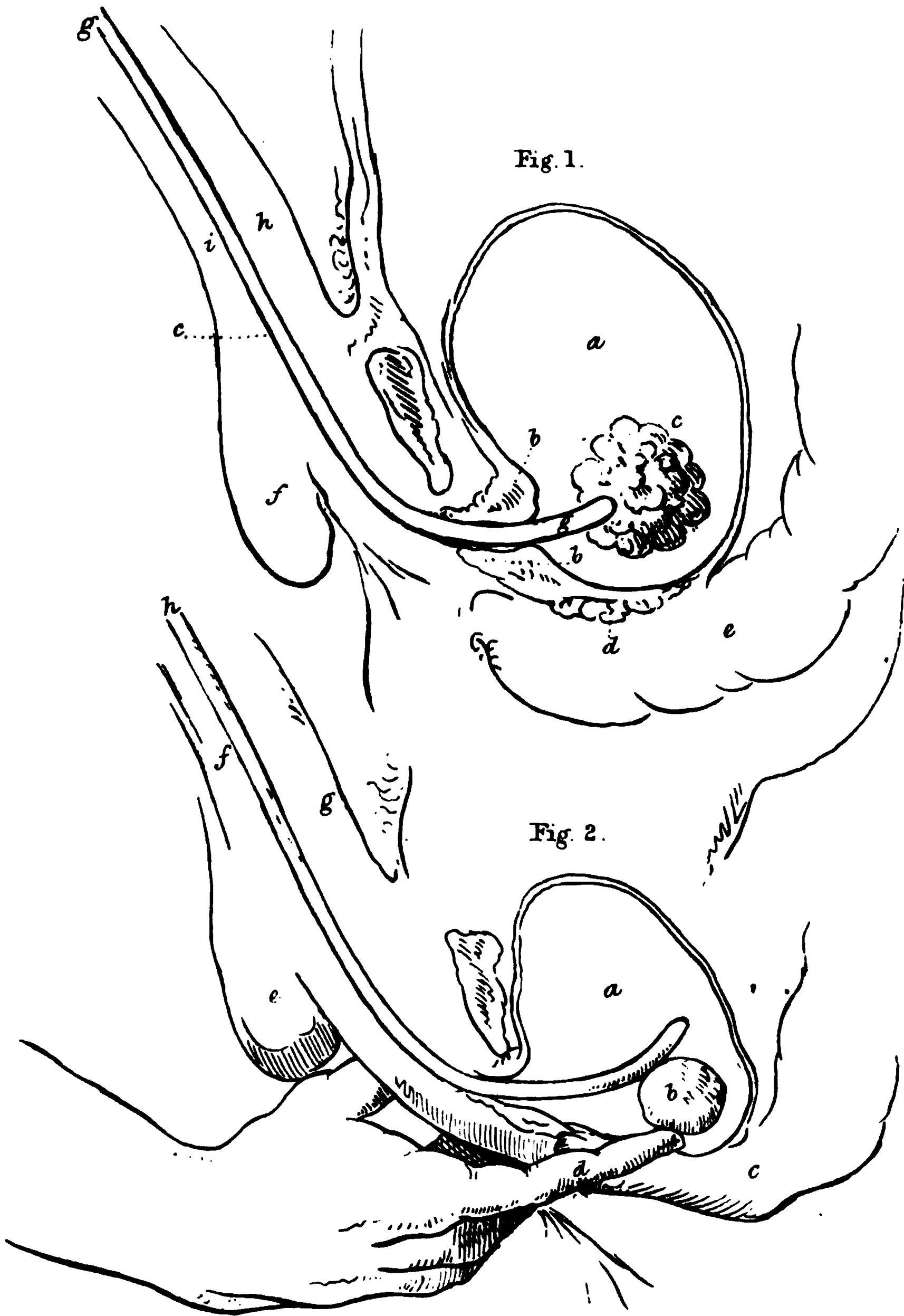


Plate E. 10.

PLATE E. 19.

This sketch represents the anatomy of the parts concerned in the lateral operation for the stone.

- a.* Accelerator urinæ.
- b.* Erector penis.
- c.* Sphinctor ani.
- d.* Transverse perineal muscle.
- i.* Levator ani.
- e.e.e.e.* Integuments.
- f.* Anus.
- g.* Penis.
- h.* Scrotum.
- 1. Left common pudic artery.
- 2. Proper perineal twig.
- 3. Twigs to the erector penis.
- 4. Deep branch of the pudic artery.
- 5. 5. 5. Twigs of the internal pudic nerve.
- 6. The vena comes on the left side.

See page 824.

PLATE E. 20.

*Posterior Operation of Lithotomy.**

- a.* Bladder.
- b.* Stone.
- c.* Rectum.
- d.* The coats of the bladder and rectum in contact, and the part which is divided in this operation.
- e.* Sphinctor ani muscle.
- f.* The speculum ani, or dilating forceps.
- g.* The staff.
- h.* The corpus cavernosum penis.
- i.* Prostate gland.
- k.* The scalpel.
- l.* The *cul-de-sac* of the peritoneum.
- m.* Os coccygis.
- n.* Sacrum.
- o.* Integuments.
- p.* Lumbar vertebræ.
- q.* Anus.
- r.* Peritoneal covering of the bladder.
- s.* The scrotum.
- t.* Corpus spongiosum urethræ.
- x.* The pubis.

* M. Sleigh "On Lithotomy."

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W Cocks

Operation.

The speculum ani* (having lain in a little warm water for some time previously, and then rubbed with a little sweet oil) should be gradually introduced into the rectum; the screw should then be slowly and steadily turned, by means of which its blades are separated, and the power of the sphinctor ani muscle overcome. The anus thus opened to a sufficient extent† (transversely), the index finger of the left hand should be placed on the posterior edge of the prostate gland, which is the anterior boundary of the part of the bladder to be divided. The scalpel is then to be introduced; and by measuring the knife with the index finger, the length of our incision can be regulated with accuracy according to our wishes. The staff having been previously introduced into the bladder, will be felt pressing the coats of the viscus against the rectum. This will be an infallible criterion by which we can judge of the situation for our incision, and of the nature of the substance interposed between the staff and our finger. We can then divide the parts either directly on the staff or by its side.

Upon the incision being made, the urine will gush

* This instrument has been very much improved by Mr. Weiss, of the Strand.

† We may safely dilate it from two to three inches in an adult.

out; and, in all probability, the stone will be forced out in the same moment. Should the calculus not escape with the urine, the common forceps is to be introduced through the rectum into the bladder, and the stone extracted according to the principles given for the lateral operation.

The bladder can be washed out by means of a syringe, with a little tepid water. After which a gum-elastic catheter is to be introduced into the bladder through the urethra, and kept in till the adhesive process of inflammation commences, so as to unite the divided surfaces.

The patient is to be given an anodyne, composed of about thirty or forty drops of the tincture of opium. He is then to be put to bed, and to be kept lying on his abdomen till the time above-mentioned for removing the catheter.

Pl. E. 27.

WPC 2024

PLATE E. 21.

Represents the bladder of an adult female, with a calculus in it. This preparation shows the contraction of the bladder round the calculus, which fills its capacity almost entirely; and the thickening of its coats, and enlargement of the ureters.

It shows, also, the thickening and spongy state of the mucous membrane of the bladder.

PLATE E. 22.

*The Urinary Bladder, having a Stone sacculated
betwixt its coats.*

- a. a.* The prostate gland divided.
- b.* The urethra.
- c. c.* The coats of the bladder considerably thickened.
- d.* A calculus, seated within a sac and half concealed.
- e. e.* Opening of the ureters into the bladder.

See page 830.

Plate E 22

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Fig1.

Fig.2

W. Cocke.

PLATE E. 23.

Represents lithic calculi.

Fig. 1.

Shows the oval shape, and finely tuberculated though smooth surface of the calculus.

Fig. 3.

Shows the internal concentric layers of a lithic calculus.

See pages 1163 to 1179.

PLATE E. 24.

This plate represents various calculi.

Fig. 1.

An adherent mulberry calculus.

Fig. 2.

Section of the above calculus.

- a.* The nucleus.
- b. b. b.* The parts immediately surrounding the nucleus ; demonstrating that particular stage of its growth at which the mulberry calculus begins to assume the peculiar appearance which constitutes its most striking character.

See pages 1163 to 1179.

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8



W^d Cock

Fig. 3.

A cystic calculus, seen externally.

Fig. 4.

A section of the same.

Fig. 5.

A cystic calculus, taken from the kidney.

Fig. 6.

A calculus with three flattened sides : a form which calculi often assume, from pressure against each other.

Fig. 7.

Crystallized triple calculus, or ammoniaco-magnesian phosphate.

Fig. 8.

The hemp-seed calculus, or smooth oxalat of lime.

Fig. 9.

A well-characterized fragment of pure bone-earth

calculus, in which the radiating, as well as concentric fibres, are distinctly expressed.

Fig. 10.

A calculus exhibiting nearly all the species in concentric layers: viz., lithic in the centre, *l.*; bone-earth next, in *p.*; mulberry next, in *m.*; and fusible last, in *f.*

ANALYSIS OF URINARY CALCULI.

Mr. Wood states that the most ready means of distinguishing calculi from one another, and of analysing them when the various ingredients are intimately blended together, is to divide the calculi, so that their different laminæ may be seen and analysed separately.

This operation should be carefully performed with a very fine saw in that direction which will expose the most extensive surface when divided: a few grains should then be scraped with a penknife from each lamina, commencing with the nucleus, and proceeding towards the exterior, care being taken to select the central portion of each layer, that it may not be mixed with those on either side of it.

The apparatus required is simple, and the materials are few in number:—some watch glasses, a spirit lamp, a brass stand with rings for holding the glasses, glass rods for stirring the solutions,* a pair

* I have found small glass tubes drawn out to a fine point, which may be readily done by the heat of a spirit-lamp, extremely useful for removing the fluid from the undissolved portion, which is easily effected by carefully immersing the point in the fluid, and applying the mouth to the other extremity. They are also useful

of platina forceps, a piece of platina foil, a blow-pipe, and some stoppered bottles containing pure nitric, muriatic, and acetic acids, solutions of potassa, ammonia, carbonate of ammonia, and oxalate of ammonia, with distilled water, complete the list.*

At present only six ingredients have been discovered in urinary calculi, viz:—uric acid, urate of ammonia, cystic oxide, phosphate of lime, oxalate of lime, and the phosphate of ammonia and magnesia.

One or two other substances have been discovered, but in so few instances as not to deserve mention with the others, such are carbonate of lime, and the two substances discovered by Dr. Marcet,—the xanthic oxide and the fibrinous calculus.

These may be distinguished from each other by the following tests:—Three of them are soluble in cold solution of potassa, the uric acid, urate of ammonia, and cystic oxide.

The first dissolves in cold solution of potassa, and evolves no ammoniacal odour during its solution; on the addition of dilute muriatic acid a copious white precipitate falls. Urate of ammonia resembles the last, excepting that copious fumes of ammonia are disengaged during the solution, which may be

for experiments on very minute quantities, as by filling them with any fluid, and closing the larger end with the finger, the fluid is retained; and may be allowed to escape gradually, in quantities as small as can possibly be required.

* Pieces of broken window-glass answer for many purposes as well as watch glasses, and are of course much more economical.

detected simply by the smell, or by holding the stopper of the nitric or muriatic acid bottle over the glass containing the materials, when dense white clouds of nitrate or muriate of ammonia will instantly be produced ; or a piece of moistened turmeric paper will be reddened if held over the glass. In either case the effect will be much increased by gently heating the glass. This variety is also soluble with comparative ease in distilled water, a fact first noticed by Dr. Prout.

Cystic Oxide Calculi—dissolve readily in cold solution of potassa, give off no ammoniacal fumes, and afford no precipitate on the addition of dilute muriatic acid. Four varieties are soluble in dilute acids, namely :—the phosphate of lime, the phosphate of ammonia and magnesia, or triple phosphate, the oxalate of lime, and the cystic oxide, and of course any mixture of them. All these are soluble in muriatic acid, diluted with four parts of water, and are all precipitated by ammonia and the fixed alkalies, excepting the cystic oxide, which being equally soluble in acids and alkalies, is of course not affected ; it may, however, be thrown down by the carbonate of ammonia.

These may be distinguished from each other in the following manner :—

The *Phosphate of Lime Calculus*—when heated before the blow-pipe undergoes a very trifling alte-

ration; no peculiar smell is perceived excepting that of burning animal matter when the heat is first applied; the ash is white, not alkaline, dissolves readily and quickly in dilute acids; and the solution gives a precipitate, with pure ammonia, and with its oxalate, provided there be no great excess of acid. The triple phosphate likewise suffers very little alteration before the blow-pipe, unless the heat be very strongly urged, when it fuses imperfectly; copious fumes of ammonia are disengaged; the ash is generally brown, not alkaline; is soluble, but not readily in dilute muriatic acid, and precipitable in the form of crystalline grains, by ammonia, showing the re-formation of the triple phosphate. The oxalate of ammonia does not precipitate this salt when no phosphate of lime exists in combination with it. The peculiar fetid odour disengaged on the application of heat, and its ready solution in both acids and alkalies, sufficiently characterize the cystic oxide.

The Oxalate of Lime Calculus—when heated before the blow-pipe blackens, is enlarged in volume, and leaves a great quantity of ash of an intense whiteness, which is soluble with effervescence in dilute muriatic acid, unless the heat has been intense, and applied for a long time, when it dissolves quietly. Pure ammonia produces no precipitate from the solution, but a copious bulky one is thrown down by the oxalate of ammonia. This ash gives a deep red tinge to moistened turmeric paper, and is in fact pure lime.

Thus far the analysis is sufficiently easy, the calculi or laminæ consisting of only one ingredient; few calculi, however, are of a nature so simple, the greater number being composed of two or more ingredients, sometimes in separate laminæ, sometimes blended together; and it is in the examination of these that the greatest difficulty is experienced, which I shall endeavour by the following directions in some measure to remove.

Uric Acid and Oxalate of Lime.—Calculi of this composition, when digested in solution of potassa, washed, and filtered, the potassa will dissolve all the uric acid, which may be obtained by adding dilute muriatic acid to the filtered liquor, and the solid residue being heated before the blow-pipe, will give the results mentioned above. This mixture generally decrepitates loudly when first heated.

Uric Acid and Phosphate of Lime.—This mixture may be treated as the last. The uric acid being dissolved out by potassa, and the remainder may either be heated before the blow-pipe or dissolved in dilute muriatic acid, and will afford the results mentioned under the head of phosphate of lime calculi.

Uric Acid and Triple Phosphate.—When calculi of this composition are digested in solution of potassa the acid is separated; a very powerful ammoniacal odour is evolved; and the undissolved portion, when

well washed and dissolved in dilute muriatic acid, will, on the addition of ammonia, be reconverted into triple phosphate, in the form of small acicelar crystals.

Phosphate of Lime and Phosphate of Ammonia and Magnesia, or the Fusible Calculus.—This variety is immediately recognised by readily fusing before the blow-pipe into an opaque white shining enamel. It suffers very little diminution in bulk, gives off copious fumes of ammonia, and the ash is not alkaline.

Phosphate of Lime and Oxalate of Lime.—These calculi do not fuse before the blow-pipe, but swell up in proportion to the quantity of oxalate of lime they contain, give out no smell of ammonia; the ash is alkaline, and if it be dissolved in dilute muriatic acid, the solution precipitated by ammonia, and filtered, a precipitate is produced in the filtered fluid by the oxalate of ammonia. Phosphoric acid will dissolve out the phosphate and leave the oxalate.

Uric Acid and Fusible.—These calculi blacken before the blow-pipe, diminish in bulk in proportion to the quantity of uric acid, evolve a powerful smell of ammonia, and presently fuse. The ash is very slightly alkaline, dissolves without effervescence in dilute muriatic acid, and is precipitable by ammonia. We are indebted to Dr. Wollaston for the following

method of analyzing calculi of this description :— Digest in cold distilled vinegar, which takes up only the triple phosphate ; dilute muriatic acid will next separate the phosphate of lime ; and the remainder, which will be the uric acid, may be recognized by the usual tests.

Triple Phosphate and Oxalate of Lime.—This mixture does not fuse before the blow-pipe, gives off a pungent ammoniacal odour, swells up in proportion to the quantity of the oxalate, and does not perceptibly diminish in quantity. The ash is more or less alkaline according to circumstances, dissolves readily in dilute muriatic acid, and after ammonia has precipitated all it can throw down, a further deposition takes place in the filtered liquor, on the addition of the oxalate of ammonia.

Fusible and Oxalate of Lime.—This calculus differs from the last only in undergoing a partial fusion after the heat has been applied a short time.

Many calculi contain uric acid in so small a proportion, as not to influence their external character and appearance : in these it may readily be detected by placing a small portion of the calculus or lamina in powder on a piece of glass, and adding a drop or two of pure nitric acid ; heating it over a lamp very carefully, to prevent it from charring. Should there be the smallest quantity of uric acid, a red colour

will appear as the mixture becomes dry, and will be deep in proportion to the quantity of uric acid. A drop or two of a solution of pure ammonia, added when it has cooled, will develop a beautiful purple tinge. If it be an object to ascertain the exact proportion of uric acid, take any given weight of the calculus and digest it in dilute muriatic acid, and the undissolved portion will be the uric acid.

Plate E. 26

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WP Cooke.

PLATE E. 25.

Cancer of the Scrotum.

- a. a.* Scrotum.
- b. b.* Indurated cellular tissue surrounding the ulceration.
- c. c.* The ulcer: its edges were everted, ragged, indurated, and somewhat raised above the surface of the scrotum.

* See page 1034.

PLATE E. 26.

*Extensive Encephaloid Tumour, situated in the body of
the Testicle.*

- a.* Spermatic cord.
- b.* The encephaloid mass.
- c.* The epididymis.

See page 1082.

Plate E 26.

W. Cocks

Plate E 27.

W.P. Cocke

PLATE E. 27.

Section of a Schirrous Testicle.

- a.*** The spermatic cord.
- b.*** The body of the testicle cut in two.
- c.*** Radiated appearance of the internal texture of the testicle.
- d.*** The epididymis, enlarged and very much thickened.
- e.*** The tunica albuginea, thickened and of a fibro-cartilaginous texture.

See page 1079.

PLATE E. 28.

The Operation of Removing the Testicle.

- a. a.* The testicle firmly grasped by the left hand of the surgeon, so as to make the skin tense on the fore part of the scrotum.*
- b. b.* The incisions which are made just above the sound portion of the spermatic cord, and extend to the bottom of the scrotum.
- c. c.* Cut surfaces of the integuments of the scrotum.
- d. d.* Ulcer—fungus and diseased skin within the incisions.

* The parts must be freed from hair prior to commencing the operation.

See page 302.

Plate E. 28

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W. Cocke.

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PLATE E. 29.

Obstruction of the Vagina.

Complete obstruction of the vagina, in a young woman eighteen years old.

- a. a.* External labia.
- b.* Nymphæ.
- c.* Meatus urinarius.
- d.* The entrance to the vagina hermetically sealed by the Hymen: this membrane was an eighth of an inch in thickness, and of a ligamentous texture.

See page 1201.

PLATE E. 30.

Fig. 1.

Extensive ulceration of the labium.

- a. a.* A large and irregular shaped ulcer, extending deep into the cellular tissue of the part.
- b. b.* The edges of the ulcer, as well as the surrounding parts, indurated.
- c. c.* Parts in a state of inflammation.

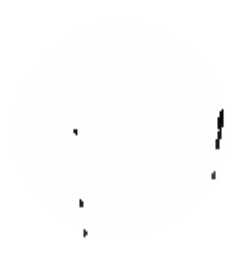
Fig. 2.

Fungoid excrescences arising from the nymphæ of a young woman twenty-one years old, who had suffered much from syphilis, and the injudicious use of mercury, for twenty months.

a c

b

Fig. 32. E. 2.



b



PLATE E. 31.

A tumour, the size of a hen's egg, of a fleshy consistency, firmly attached to the neck of the urethra. This tumour completely obstructed the entrance of the vagina.

a. Clitoris.

b. Nymphæ.

c. Méatus urinarius.

d. The tumour, externally, presented a granulated surface. When sliced, its internal texture appeared homogeneous.

PLATE E. 32.

A scirrhus tumour, situated on the left side of the lower part of the abdomen, occupying the mons veneris, and extending into the labium of that side.

- a. a.* The tumour at the lower part of the abdomen.**
- b. b.* The mons veneris presenting a lobulated surface.**
- c. c.* The labium on the left side, very much enlarged, and of a stony hardness.**
- d. d.* A varicose and tortuous state of the veins.**

Plate E 32.

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d

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HP Cock &

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Plate E 38.

HP Coe Co

PLATE E. 33.

This sketch represents a polypus of the uterus.

- a.* The body of the uterus.**
- b.* The pedicle of the polypus.**
- c. c.* The uterus.**
- d.* A portion of the peritoneum.**
- e.* The bladder.**
- f. f.* The ovaries.**
- g. g.* The fallopian tubes.**
- h. h.* The fringed extremities of the fallopian tubes.**
- i. i.* Portions of the round ligaments.**
- k. k.* Supporters of the preparation.**

See page 987.

PLATE E. 34.

A very distinct view of carcinoma uteri, and of the changes which take place in that viscus in consequence of this disease.

- a.* The carcinomatous tumour, seated at the posterior part of the cervix of the uterus.
- b.* The os uteri much enlarged, which forms one of the principal characters of this disease, especially when the sides of the opening are hard and resisting. A small portion of the vagina is left surrounding the opening.
- c.* The cavity of the uterus near the cervix.
- d.* The cavity of the uterus near the fundus.
- e.* The fundus of the uterus.

The sides of the uterus are kept asunder by two pieces of quill placed transversely across the preparation.

Plate E 34.



W. Cochr.

Plate E 35

W. C. C. C.

PLATE E. 35.

A posterior view of the same preparation.

- a.* Shows a section of the carcinomatous tumour, a part of which only could be exposed in plate 32.**
- b.* The fundus of the uterus.**

NOTE.—As the size of this drawing does not exceed the actual size of the preparation, it is obvious that all the parts of the uterus have undergone some degree of enlargement.

PLATE E. 36.

This sketch represents an imperforate rectum in a new-born infant.

23
Plate E 36.

W^d Cocks.

Fig1.



HP Cocks.

PLATE E. 37.

Fig. 1.

A large abscess below the verge of the anus.

Fig. 2.

Fistula in ano, with a fungoid excrescence surrounding the external aperture of the sinus.

***a.* The fungoid mass.**

***b.* The external aperture of the fistulous canal.**

***c.* A probe passed directly into the rectum.**

See page 201.

PLATE E. 38.

Fistula in Perineo.

- a.* Calibre of the urethra very much contracted.**
- b.* The strictured portion of the urethra.**
- c.* Ulceration of the urethra posterior to the stricture.**
- d.* Ulceration of the cellular tissue of the perineum.**
- e.* A probe passed into the fistulous canal.**

See page 477.

Plate E 38.



W. Coe Ks.



FIG. 1.



FIG. 2.

PLATE F. 1.

Fig. 1.

Venesection at the bend of the arm.

The skin of the arm must be pressed strongly upwards, and a ligature a yard and a half in length, and three-fourths of an inch broad, passed with some degree of tightness round it a little above the elbow, and continued until a proper turgescence of the veins is conspicuous, the ligature being at the same time tied with the slip knot on the outer side. The thumb of the left hand is next applied on the vein an inch and a half below the place you intend to puncture; then holding the head of the lancet between the thumb, fore and middle finger of the right hand, the ring and little finger being distended to serve as a fulcrum, you bend the fingers which hold the lancet, the point of which turns towards the vessel, and by a moderate and gentle extension of these fingers you penetrate into the vein, raising the point of the instrument in order to enlarge the orifice.

See pages 233 234.

Fig. 2.

Abstraction of blood from the foot.

Having compressed the vein by means of a piece of broad tape just above the ankle joint, the foot is to be placed in a pan of warm water, and kept there for a short time, so as to cause a swelling of the veins; when this is accomplished select one of the largest for the operation. The incision is to be made in an oblique direction. When the ligature is removed the blood will cease to flow, and adhesive plaster is the best bandage.

NOTE.—Sometimes it is found absolutely necessary to keep the foot in the warm water during the whole time of the operation, to promote the flow of blood.

Plate F.2.

Fig



PLATE F. 2.

Fig. 1.

Bleeding in the neck from the jugular vein.

The head being laid on one side, the surgeon compresses the external jugular vein with his thumb, as represented in the sketch, so as to make the part above swell, and then a lancet is pushed in an oblique direction into the vessel till the blood rises up to the point of the instrument, next bringing up the front edge in as straight a line as possible; the wound in the skin will be just the same size as that in the vein. The flow of blood will readily stop on removing the pressure.*

Fig. 2.

Opening of the temporal artery.†

* It is stated by some of the first surgical authorities, that pressure below the orifice should not be removed until a compress has been applied upon the latter, otherwise the air might penetrate into the open mouth of the vein, and thus transform a slight operation into a wound suddenly fatal.

† The operation is to be performed as described in Vol. I. Plate B. 6. *a*.

See page 234.

PLATE G. 1.

The Effects of Scalds.

Fig. 1.

In this case the man, when a child, was scalded by pulling a pot of boiling water on him from the table. The right side of the cheek, as well as the angle of the mouth, are drawn down and firmly fixed to the top of the shoulder.

Fig. 2.

This originated from a similar circumstance ; but in this case the poor creature's under lip was frightfully drawn down over her chin, and firmly united to the upper part of the chest by strong fluted bands of cellular tissue of a fibro-cartilaginous texture.

Fig 1

Plate G 1

- 16 -

Fig. 1.



etc

W Clocks

PLATE G. 2.

Carbuncles of the Head and Neck.

Fig. 1.

Several carbuncles situated on the head of a patient who at the time was labouring under typhus fever.

Fig. 2.

An extensive carbuncle situated in the cellular tissue of the nape of the neck of a gentleman upwards of sixty years old, and who got perfectly well after the tumour had been freely and repeatedly incised.

See page 296.

PLATE H. 1.

Fig. 1.

An extensive scirrhus swelling of the breast.

Fig. 2.

An ulcerated cancer of the breast of an aged woman.

a. a. Lobulated state of the breast.

c. An extensive ulcer which had penetrated deep into the substance of the breast.

d. d. Indurated and everted edges of the ulcer.

See page 287.

Fig. 1.



Fig. 2.



d *c* *d* *~*



PLATE H. 2.

The Operation of Removing a Scirrhus Breast.

- a.* to *b.* Marks the course of the first incisions through the integuments of the breast.
- c. d.* The integuments freely divided and dissected back from the diseased gland.
- e.* The pectoral muscle exposed after the removal of the gland.
- f.* The edges of the wound brought together by means of strips of adhesive plaster.

PLATE H. 3.

The disease represented in this plate begins in persons advanced in years, by a swelling behind the areola or nipple, and the latter becomes enlarged or drawn in.

When it ulcerates, the sore has a cancerous aspect, but it is rather more disposed to slough than the cancer of the female. The edge of the ulcer is ragged, the surrounding parts are hard, and the pain is of a lancinating kind as in true cancer.

Fig. 1.

Anterior view of the nipple of the male, in which the mamillary substance is affected with cancer, the nipple is enlarged, and the surrounding parts ulcerated.

Fig. 2.

An internal view of the same disease, a section having been made through it to shew the scirrhus deposit.

It has very much the character of cancer in the female breast.

- a.* The surrounding adeps.
- b.* The scirrhus deposit.

P.L.H. 3.

Fig 2.

W Cocks

ANATOMY OF THE EYE AND ITS APPENDAGES.

THE *Palpebræ*—are two moveable veils lying upon the anterior part of the ball of the eye. They are separated from the forehead by the eyebrow, and confounded below with the cheek, and are distinguished into upper and lower.

The *Tarsi*—are thin fibro-cartilaginous bodies, placed at the edges of the eyelids; they are firm, and elastic; of an oblong shape; broader in the centre than at the extremities, and thicker at their margins, where they look at each other. The edges of the tarsi are provided with hairs (called cilia, or eye-lashes), of a greater or less length, more or less numerous, and of a colour generally resembling the hair of the head.

Meibomian or *Ciliary Glands*—are small follicles situated on the inner surface of the tarsi. They are deposited one above another in such a manner as

to represent two longitudinal parallel lines, of a yellowish colour. They are very numerous; there are from thirty to thirty-six of them in the upper eyelid, and from twenty-four to thirty in the lower.

Caruncula Lachrymalis—is a small reddish body, placed at the inner angle of the eyelids, and inclosed between the surface of the globe of the eye and the conjunctiva, which is reflected over it. It is studded with short bristly hairs.

Punctum Lachrymale—is observable near the caruncula lachrymalis, on the margin of each eyelid, at the extremity of the tarsus. Each punctum is the outer commencement of a slender little mucous canal (*lachrymal duct*), which leads into the sac for the reception of the tears.

Plica Semilunaris—is a delicate, crescent-shaped, mucous membrane, situated a little nearer the eyeball than the caruncula; the cornua pointing upwards and downwards; the convexity towards the caruncula, and the concavity towards the cornea.

Lachrymal Sac—is sunk into the recess between the margin of the orbit and the tendon of the orbicularis palpebrarum. The fibres of that muscle cover the sac, and also the ducts continued from the puncta lachrymalia. The sac, which is of an oblong shape, is placed with the tapering extremity

turned downwards. From the most depending part of the sac, the nasal duct arises: it opens by a small rounded mouth into the nostril, about half an inch behind the ascending plate of the jaw-bone, and nearly opposite to the middle of the inferior spongy bone.

Tunica Conjunctiva—is a very fine, transparent, and sensible membrane, lining the internal surfaces of both eyelids, and is reflected over the anterior part of the ball of the eye, to which it is connected by cellular tissue.*

Cornea—is the transparent anterior part of the globe of the eye.† It is firmly connected to the sclerotica, and consists of several lamellæ; between which there is interposed a cellular substance, filled with a perfectly pellucid fluid.

Tunica Sclerotica—is a firm white membrane, consisting of lamellæ, firmly attached and interwoven, and not capable of being regularly separated by maceration; upon its inner surface it has a loose and soft membrane, which connects it with the

* Dr. Ribes believes that the cornea is covered by a particular membrane, which is united to the conjunctiva by its circumference, without being a continuation of it.

† The cornea is contained in the anterior aperture of the sclerotica, like the glass of a watch-case within its frame—is about the third of a line in thickness.

choroid coat. It envelopes all the ball of the eye, except the portion anteriorly occupied by the cornea; posteriorly, it is pierced by the optic nerve.

Tunica Choroides—is the vascular coat of the eye; it begins at the entrance of the optic nerve, and ends near the edge of the cornea, forming a whitish circle of some firmness, called the ciliary circle,* and by which it adheres to the sclerotica. It is composed of laminæ, and of that part of the choroid coat next the sclerotic coat; which when minutely injected, presents to our view by a microscopical examination, a congeries of minute vessels, and an intricate vascular net-work. The vessels of the choroid secrete a dark pigment, which stains the contiguous adhering surface of the sclerotic coat. This membrane is bountifully supplied with nerves.

Iris—is the circular membrane, with an opening through its centre, called pupil, forming an imperfect curtain around the cavity of the eye, which contracts or dilates according to the intensity of light. It consists of a radiated and circular layer of muscular fibres; its arteries, from the ciliary,

* The orbiculus ciliaris, is a ring of light grey matter, about a line and a half in breadth, which is attached to the inner surface of the sclerotica, just at its junction with the cornea. Externally, it is united, though slightly, with the sclerotica; posteriorly, with the choroid membrane; and anteriorly, with the iris, which may be said to be embedded in its substance.

form by anastomosis two circles:—one near the circumference, called *zona major*; the other near the pupil, called *zona minor*. Its veins pass to the *vasa verticosa* of the choroid. The posterior part of the iris is called *uvea*, and is composed of straight fibres, converging from the ciliary to the pupillary margin, quite unlike those in the anterior part.

Ciliary Processes.—They appear to be radiated folds of the choroid coat, from sixty to seventy in number, long and short alternately, and gathered into folds at their origin.

Membrana Pupillaris—is an extremely vascular membrane, which extends across the pupil of the foetus before the seventh month.* It receives two different sets of arteries: one larger, from the iris; and the other, much smaller but very numerous, from the chrystalline capsule.

Retina†—is a membrane of the most delicate texture of any in the animal body; it is transparent in the recent state, and so soft that it will tear with

* This membrane begins to open in its centre at the seventh or eighth month of pregnancy, when the eyes have acquired some degree of size, and when probably the elliptic arches of its vessels begin to be gradually retracted into the inner ring of the iris.

† Ribes does not consider the retina to be an expansion of the threads which compose the optic nerve; he thinks that it forms a particular membrane, in which the branches of the optic nerve are distributed.

its own weight. It lies expanded over the vitreous humour, and contiguous, but not adhering to the choroid coat, or its pigment. The medullary matter of the retina goes no further than the ciliary circle, and its nervous filaments terminate upon the edge of the crystalline capsule.

Crystalline Lens — a nearly spherical body, embedded in the front of the vitreous humour. It is retained in its situation by a compact membrane, called its capsule;* which is closely connected to the membrana vitrea, but is much more firm, dense, and resisting, than that membrane.†

Vitreous Humour‡—is a glairy fluid, heavier than water, perfectly pellucid, fills the whole concavity of the retina, forms about four-fifths of the entire bulk of the globe. The substance of this humour is penetrated by a branch of the arteria centralis retinæ, which contributes a few very delicate vessels to its capsule tunica hyaloidea.§

* A small quantity of watery fluid (*aqua Morgagni*) is situated between the capsule and the lens.

† It requires some force to lacerate the capsule of the lens. This circumstance should be kept in view by the operator.

‡ The vitreous humour forms about two-thirds of a sphere, from which the anterior segment had been taken out. It appears to be secreted by the minute arteries which are distributed to the parietes of its membrane.

§ This membrane does not alone contain this humour; it is sent down amongst it, and separating, forms it into cells.

Canalis Petitianus—a triangular cavity between the two laminæ of the hyaloid membrane, formed by the separation of the anterior lamina from the posterior.

*Aqueous Humour**—a small quantity of clear water, filling up the space between the cornea and the front of the crystalline lens.

Arteria Centralis Retina—arises from the ophthalmic artery. It pierces the optic nerve, and enters the eye through the porus opticus, to supply the retina.

Nervi Ciliares—run in parallel lines, at equal distances, upon the choroid; and, from their size and whiteness, are particularly conspicuous.

Vasa Verticosa.—Beneath the ciliary arteries the choroid membrane presents on its opposite sides vessels arranged in form of trees, with weeping branches, which have been named *vasa verticosa*: they are veins returning the blood distributed to the ciliary processes, and are collected into three or four distinct venous trunks.

* This is a transparent fluid, evaporates on exposure to heat, and is uncoagulable by heat, acids or alkalies; it is in quantity about five grains; in quality viscous, and slightly saline. It appears to be the product of arterial exhalation; it is soon reproduced, as we see after the operation for cataract.

PLATE J. 1.

*The Lachrymal Sac and its Ducts, as well as the Vessels
of the Choroid Coat and Iris.*

Fig. 1.

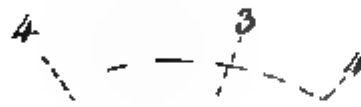
- a.* Orifices of the meibomian glands.
- b.* Semilunar membranula, before the caruncle lachrymalis.
- c.* Caruncle lachrymalis.
- d. d.* Puncta lachrymalia.
- e. e.* Two small canals, joined together near the nasal sac.
- f.* Lachrymal sac.

Fig. 2.

- 1. The optic nerve.
- 2. The sclerotic coat cut through and laid back.
- 3. Cornea.
- 4. The ophthalmic artery.
- 5. 6. The ciliary arteries.
- 7. The central artery of the retina.

Fig1.

Fig.2



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$$12 \left\{ \begin{array}{l} \dots \\ \dots \\ \dots \end{array} \right.$$

8. A branch which goes into the hard sheath of the optic nerve.
9. An arterial ring at the insertion of the optic nerve.
10. 11. The long ciliary arteries.
12. Four anterior ciliary arteries.
13. The posterior ciliary arteries, which perforate the sclerotic.

Fig. 3.

The cornea is removed so as to show the iris with its vessels.

1. 2. The long ciliary arteries, which divide into two branches.
3. The anterior ciliary arteries.
4. The ciliary ring.
5. The larger circle of the iris.
6. A portion of the smaller circle.*
7. The lens.

* The whole circle cannot be seen, as all the vessels are not equally well filled.

PLATE J. 2.

Perpendicular Section of the Eye.

- a.* Anterior chamber of aqueous humour.
- b.* Posterior chamber of aqueous humour.
- c.* Choroid coat.
- d.* Cornea.
- e.* Iris.
- f.* Arteria centralis retinae.
- g.* Crystalline lens.
- h.* Ciliary folds.
- i.* Ciliary processes.
- k.* Vitreous humour.
- l.* Pupil.
- m.* Retina.
- n.* Sclerotic coat.
- o.* Vena centralis retinae.
- p.* Optic nerve.

Fig 1

1

Fig 2

Fig. 3

22

WP Cocks

PLATE J. 3.

Fig. 1.

Simple acute inflammation of the conjunctiva.*

Fig. 2.

Inflammation of the iris† strongly contrasted in character with that of the conjunctiva.

In the former, the white line around the cornea, the arrangement of the inflamed vessels in straight lines, running in radii from the cornea, the intensity of the inflammation near the cornea, and its gradual diminution as you recede from it, together with the evidently deeper seat of the enlarged vessels, are easily distinguished from conjunctival inflammation, in which the redness is most intense upon the eyelids, and diminishes as you approach the cornea; the vessels are superficial evidently in the conjunctiva, and not moving with the motions of the eye-ball, and not arranged in right lines like those of the sclerotica, which are enlarged in iritis.

Fig. 3.

Strumous nebula, with vessels in the form of radii overshooting the cornea. These are not continuous with, but distinct from the vessels of the conjunctiva, and beneath it.

See pages *921—†959 to 963.

PLATE J. 4.

Fig. 1.

- a.* The nebula* of the cornea.
- b.* The fasciculus of varicose blood-vessels of the conjunctiva, by which the nebula of the cornea is as it were nourished.

Fig. 2.

- a.* Proclivencia of the iris† through a small ulcer of the cornea.—In this figure is seen the whitish margin of the ulcer, the contracted and preternaturally displaced state of the pupil, and the oblong figure which it assumes in such cases.

Fig. 3.

The state of the eye (*fig. 2.*) after the cure of the proclivencia of the iris. The pupil in some degree recovers its natural figure.

See pages *365.—†765 to 768.

Fig 1



Fig. 2.



Fig. 3.



Fig1.

Fig2

Fig3.

W. Cocke.

PLATE J. 5.

Fig. 1.

An eversion of the lower eye-lid, occasioned by a shortening of the integuments, in consequence of an extensive cicatrix formed a little below it.

Fig. 2.

The state of the lower eye-lid (*fig. 1.*) after the operation.—In consequence of the greater shortening of the integuments towards the temples than the nose, the lower eye-lid is seen to be less elevated towards the external than the internal angle; it embraced the lower part of the eye-ball, however, sufficiently to prevent the descent of the tears upon the cheek, and to correct the deformity.

Fig. 3

Eversion of the upper and lower eye-lid.

See pages 434 to 438.

PLATE J. 6.

Fig. 1.

Two pterygia of different sizes upon the same eye.

- a.* The larger pterygium situated upon the eye-ball on the side next the nose.
- b.* The smaller pterygium on the side next the temples.

Fig. 2.

Represents a thin membranous pterygium.

Fig. 3.

One half of the anterior part of the eye-ball covered with a very large pterygium.

See pages 1002 to 1004.

Fig 1.

Fig 2

Fig 3 .

Fig 1.

Fig 2.

Fig 3.

Fig 4.

PLATE J. 7.

Opacities of the Cornea.

Fig. 1.

An opacity of the cornea from the small-pox.

Fig. 2.

An opacity of the cornea from gunpowder.

Fig. 3.

An opacity of the cornea from simple inflammation.

Fig. 4.

Opacity of the cornea from ulceration.

See pages 365 to 370.

PLATE J. 8.

Fig. 1.

Staphyloma scleroticæ.

Fig. 2.

**Staphyloma of the sclerotic and choroid coats,
situated at the bottom of the eye.**

Fig. 3.

**Another staphyloma of the sclerotic and choroid
coats similar to it.**

See pages 1044 to 1047.

Fig 1

Fig 2.



Fig 3



Fig 1



Fig 2

Fig 3.

PLATE J. 13.

Cancer of the Eye.

Fig. 1.

Carcinoma of the conjunctiva affecting the globe and eyelids.

Fig. 2.

A peculiar fungus growth interstitial to the conjunctiva and cornea.

Fig. 3.

Soft cancer of the eye.

PLATE J. 14.

Fig. 1.

Lobulated state of the eye, from a deposition of encephaloid matter within the sclerotica; also a large tumour, situated externally, of the same nature.

Fig. 2.

Exhibits the external appearance of a melanotic eye.

Fig. 3.

A section of the above eye.

Fig.1.

Fig 2.

),

Fig 3.

W² Col no

PLATE J. 16.

Fig. 1.

Beer's cataract-knife.

Fig. 2.

Saunders' needle, for dividing the lens in the operation of keratonyxis.

Fig. 3.

Schmidt's curved lancet-shaped needle, for the performance of koredialysis.

Fig. 4.

Scarpa's needle, for the depression of the cataract.

Plate J.16.

Fig 4.



Fig 3.



Fig 2.



Fig 1.

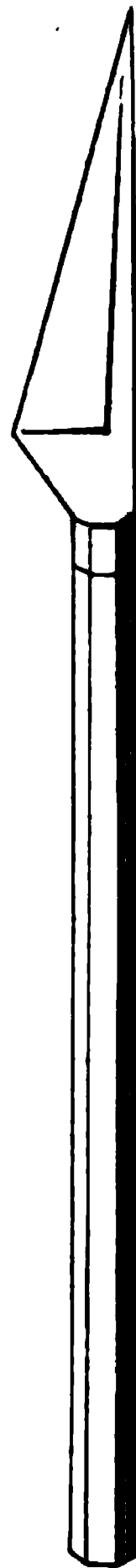


Plate K 20a

22

WP Cocks

PLATE K. 20. a.

Diseases of the Neck of the Thigh Bone.

Fig. 1.

Represents the head and cervix of the thigh bone altered by inflammation.* The neck is shortened and depressed ; a ridge runs round it, which seems to point to the place of fracture and union.

The head of the bone is flattened, and drops low, as if it had been broken down.

Fig. 2.

Another specimen of interstitial absorption of the neck of the thigh bone.

* This sketch shews how nearly, in certain conditions, the appearances resemble re-united fracture.

PLATE K. 23. a.

Fractures of the Clavicle and Ribs.

Fig. 1.

The clavicle fractured near the shoulder joint.*

Fig. 2.

The clavicle fractured in the middle.

Fig. 3.

An oblique fracture of the rib.

Fig. 4.

Transverse fracture of the rib.†

The clavicle may be broken at any part; but its middle, where the curve is greatest, is most frequently the situation of the injury. The fracture of this bone is ascertained by remarking that the shoulder is fallen lower and towards the breast; and, on feeling along the bone, the crepitation of the broken ends is perceived; perhaps the broken ends are found to have passed each other. The outer extremity, or scapular portion, is found to be most depressed. One of the principal signs of fracture of the clavicle, is the impossibility which the patient finds of applying the hand of the side affected to his forehead, or to

* See pages 530. — † 509.

Plate K. 23a

Fig 2.



W. Cocks

PLATE K. 23. b.

An Oblique Fracture of the Sternum.

A fracture of the sternum is rendered obvious by the inequalities perceptible when the surface of the bone is examined with the fingers ; by a depression or elevation of the broken pieces, a crepitus, and an unusual moveableness of the injured part in respiration. The breathing is difficult, and mostly accompanied with cough, spitting of blood, palpitations, and inability to lie on the back. When the sternum is fractured across, there is a perpetual grating of the broken parts of the bone, and this grating produces inflammation and suppuration under the bone, viz., in the anterior mediastinum. Fracture of the sternum from muscular action only, is of very rare occurrence.

See page 509.

touch the shoulder of the opposite side, for this motion twists the broken clavicle, and forces the broken ends into the cellular tissue.

A fracture of the ribs, which are not at all displaced, is very difficult to detect, particularly in fat subjects. The surgeon should place his hand on the part where the patient seems to experience a pricking pain when respiring, or in the part that has suffered injury. The patient should then be requested to cough, by which action the ribs must necessarily undergo a sudden motion, and thus a crepitus will often be rendered perceptible. A compound fracture of the ribs will not readily happen, in consequence of their projecting, for they are, in truth, beaten in when fractured. When the ribs are forced inwards, it is often accompanied with puncture of the lungs, or rupture of the intercostal artery. If the patient complain of a difficulty of breathing, with oppression in the chest, and if this be succeeded by a tumour on the broken ribs, which crackles under the finger, it is the emphysematous tumour so peculiarly characteristic of this accident. A discharge of blood, mixed with froth, from the mouth, is a sure sign that the lung or lungs are wounded.

See page 509.

Fig 1



Fig 2

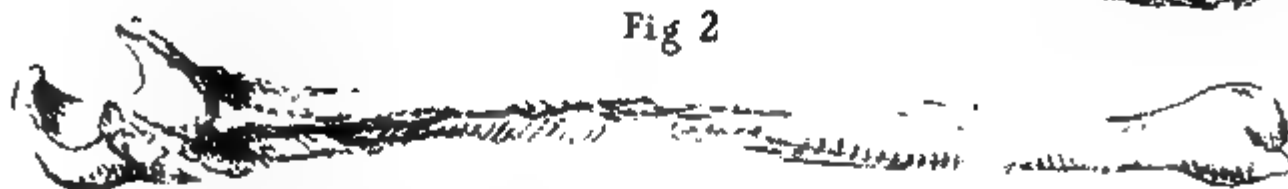


Fig 3.

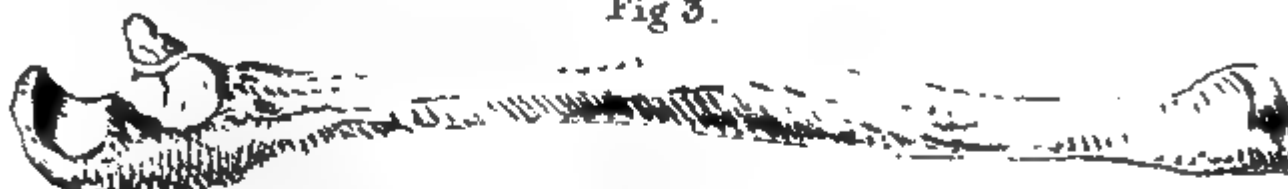


Fig 4.

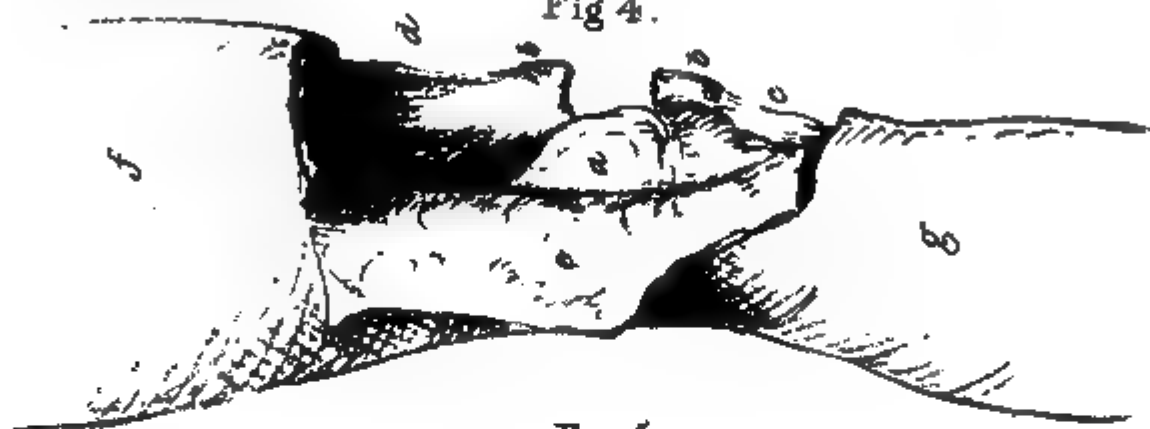


Fig 6.

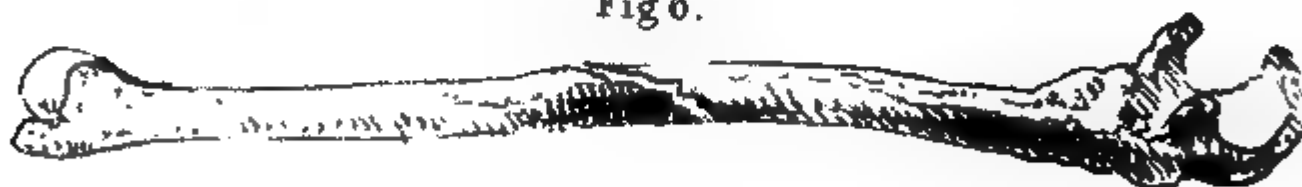


Fig 7.

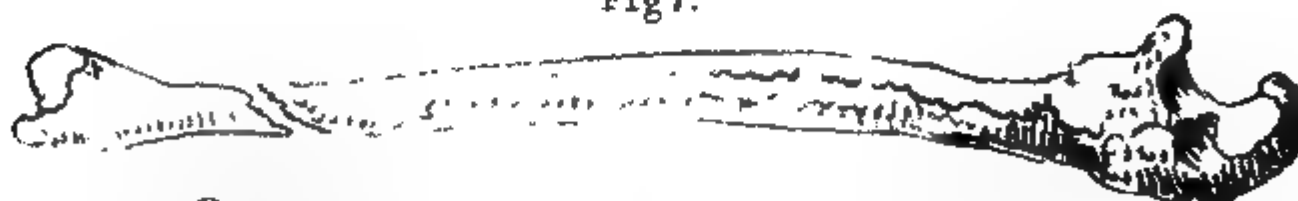


Fig 8.

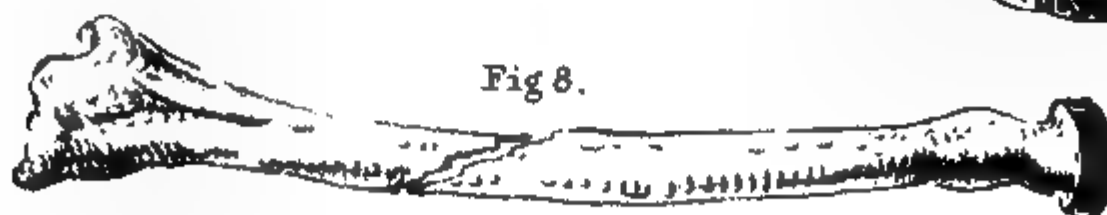


PLATE K. 26.

**These sketches represent fractures of the olecranon*
process, radius, ulna, and patella.**

Fig. 1.

Transverse fracture of the olecranon process.

Fig. 2.

Oblique fracture of the olecranon process.

Fig. 3.

Fracture of the coronoid process.

Fig. 4.

Transverse fracture of the patella.

- a.* Condylod extremity of the os femoris.
- b.b.* Fractured portions of the patella.
- c.* Ligament of the patella.
- d.* Rectus muscle.
- e.* Integuments dissected and thrown back.
- f.* Thigh.
- g.* Leg.

* Pages 537, 538.

Fig. 5.

- a.* Rectus.**
- b.* Vastus externus.**
- c.* Vastus internus.**
- d.* Inner condyle of the os femoris.**
- e.* Outer condyle of the os femoris.**
- f.* Fractured portions of the patella.**

Fig. 6.

The ulna fractured in the middle.

Fig. 7.

An oblique fracture of the carpal extremity of the ulna.

Fig. 8.

Fracture of the radius.

Plate X.



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6

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WP. 1. 1.

PLATE K. 31.

Shews a portion of carious spine.

- a.a.* The bodies of three vertebræ destroyed.
- b.* Anterior surface of the second vertebra slightly corroded.
- c.c.* The intervertebral cartilage between the 2nd, 3rd, and 4th vertebræ completely destroyed.

See page 1244.

PLATE K. 32.

An extensive exostosis of the os femoris, taken from an aged person, who had been subject to supposed rheumatic pains of the thigh for upwards of twenty years ; in every other respect he enjoyed a good state of health.

See page 464.

Plate K. 32

Wicks



e.

c--

Cocks.

PLATE K. 33.

In this drawing we have aneurism of the vessels within the substance of the thigh bone.

a.a. Section of the thigh bone.

b. The internal surface of the aneurismal pouch.

c.c. Clots of blood contained in the different cells.

d.d. The bone covering the tumour is reduced to the thickness of a wafer, and presents a dead white surface, perfectly smooth.

e.e. Arteries communicating with the sac.

Symptoms.—The affected part is swelled and painful.

The cutaneous veins are distended, tense, and varicose. The entire limb is of a reddish violet colour, and exquisitely painful on pressure. In a short time a deep-seated pulsation, isochronous with that of the arteries, may be felt in the tumour. In a more advanced state of the disease the pulsation is attended by a general “mouvement d’expansion.” The pulsations cease when the main artery of the limb is compressed between the tumour and the heart. The leg is sometimes oedematous, sometimes emaciated, and the motions of the whole limb, or only of the knee-joint, are

painful, constrained, and difficult. Pressure with the finger on some parts of the tumour communicates a feeling similar to the crackling of parchment, or the forcible bruising of an egg shell. On other parts the finger does not encounter any resistance.

MORBID ANATOMY.

The cellular tissue of the bone is either in a great part, or entirely destroyed. Its cavity is enlarged and filled with coagulated blood, disposed in concentric layers, as in the sac of an old aneurism, and these clots communicate with one or many arterial branches. The external or compact tissue of the bone is very thin, in many points destroyed, and in some points flexible and elastic, like a thin lamina of cartilage, or brittle, like the shell of an egg. The periosteum and external aponeurosis are in general thickened, and of a denser structure than when they are in a healthy state, and they not unfrequently assume a fibro-cartilaginous character.

The joint which is in the vicinity of the disease has always been found in a healthy state, although only separated from it by a layer of cartilage.

Fig 2



a.

b

c

c

W Cocks

PLATE K. 34.

Fig. 1.

An extensive abscess, situated in the tibial extremity of the os femoris.

- a.* The cancellous texture highly injected ; and at some points pus was observed to issue from its surface.
- b.* The capsule of the abscess,—it was of a fibro cellular texture, and very white.
- c.* Internal surface of the sac.

Fig. 2.

An encephaloid tumour, arising from the cancellated texture of the tibia.

- a.* Head of the tibia,—the bone is divided longitudinally.
- b.* Periosteum thickened, and very vascular.
- c.* The substance of the tumour.
- d.d.* The bone in contact with the surface of the tumour reduced to the thickness of common writing paper, but of its usual colour.
- e.* The cancelli of the lower portion of the tibia.

ANATOMY OF THE HUMAN EAR.

THE ear is the organ of hearing. It is distinguished into the external and internal ear.

THE EXTERNAL EAR comprehends the pinna and the meatus auditorius externus. The pinna is of a greater or less size, according to the individual. Its external face, which in a well formed ear is a little anterior, presents five eminences and three cavities. The eminences are

1. The helix ; it is the outer margin, the edge of which is turned over and forms the fossa innominata.
2. The anti-helix — a ridge situated more internally than the helix.
3. The tragus is a small triangular prominence that projects over the anterior and external part of the auditory tube.
4. The anti-tragus is situated opposite to the tragus, and at the lower end of the anthelix.
5. The lobule is the inferior and elongated portion of the pinna.

The cavities are—

1. *Fossa innominata* — the groove which separates the helix from the anti-helix.
2. *Fossa navicularis* — a shallow depression between the two parts of the anti-helix.
3. *Concha* — a deep excavation, bounded by the anti-helix and tragus, and leading into the meatus auditorius.

THE PINNA is formed of a fibrous cartilage, elastic and pliant; the skin which covers it is thin and dry, adheres to the fibro-cartilage by a cellular tissue, which is compact, and contains but very little adipose substance; the lobule alone contains it in considerable quantity.

The external ear has several muscles lying on it.*

THE MEATUS AUDITORIUS EXTERNUS is about an inch in length; and its direction obliquely inwards, downwards, and forwards, when cut across its figure, is elliptical, its perpendicular diameter being greater than its antero-posterior. It is so situated that it touches the maxillary condyle anteriorly, whereby, when the jaw is depressed, this canal is dilated.† Posteriorly, it lies upon the mastoid process; and superiorly,

* *Attolens auris*—anterior auris - *retrahentes auris*—*helicis major* — *helicis minor* — *tragicus* — *anti-tragicus* — *transversus auris*.

† It is for this reason, says M. Richerand, that we instinctively open the mouth the better to distinguish sounds which we are anxious to hear.

it is circumscribed by the superior branch of the horizontal root of the zygomatic process.

THE CERUMINOUS GLANDS themselves are placed exteriorly to the cutis of the meatus externus in the interstices of a reticular membrane. They are about the size of millet seed, approach to a spherical or elliptical form, and are tinged of a slight yellow by the cerumen which they contain. Each little gland sends a small duct that opens in the meatus externus, and discharges the cerumen that is there found, and answers the purpose of keeping the membrana tympani moist.

MEMBRANA TYMPANI is a thin transparent flattish pellicle, the edge of which is round and strongly fixed in the orbicular groove which divides the bony meatus of the external ear from the tympanum or barrel.

This membrane is very much stretched, or very tense, and yet not perfectly flat. For, on the side next to the meatus externus, it has a small hollowness, which is pointed on the middle; and on the side next the tympanum it is gently convex, and also pointed in the middle.

THE INTERNAL EAR lies concealed within the petrous portion of the temporal bone; it is divided into the tympanum, mastoid cells, and labyrinth.

THE TYMPANUM is a cavity of an irregular circular figure, and is bounded outwardly by the membrana tympani. It is bounded inwards by an osseous partition between it and the vesti-

bular cavity, having the foramen ovale* and the foramen rotundum† formed in it, which in the recent state are filled up by the extension of delicate membranes, and are then named fenestræ ; it is bounded on its anterior aspect with bone, but having a free communication with the posterior aperture of the nares and pharynx, through the medium of the Eustachian tube ; and it is bounded on its posterior aspect also by bone having a free communication with the mastoid cells. The cavity of the tympanum is lined with a delicate mucous membrane‡ which may be said to be a continuation of that of the nares and pharynx, extending along the Eustachian tube ; and in this cavity are contained the ossicula auditus.

MASTOID CELLS are placed behind the tympanum. They are large and numerous, freely communicate with each other, and open by a large aperture in its posterior and superior part. They may be considered as a part of the tympanum, for

* The foramen ovale is in the bottom of a deep sinus ; it is not strictly of an oval form, but has its lower side straight while the upper margin has the oval curve. This opening leads into the vestibule, or central cavity of the labyrinth.

† The foramen rotundum is more irregular than the oval hole. It does not look directly forward like it, but enters on the side of an irregular projection ; it does not lead into the vestibule, but into one of the scalæ of the cochlea.

‡ This membrane in children is no more than a mucilage ; and in them likewise the membrana tympani is thick, opaque, and covered with a whitish slimy matter.

the communication is perfectly free, and they are both lined with a delicate and vascular membrane that secretes a fluid to moisten the internal surface at the same time that it answers the purpose of the periosteum to the bony superficies.

EUSTACHIAN TUBE* is a canal, formed partly of bone and partly of fibro-cartilage, extending from the tympanum to the upper part of the pharynx. It begins by a rounded orifice in the anterior side of the tympanum, and thence extends obliquely downwards and forwards to the upper part of the pharynx, where it terminates immediately behind the posterior opening of the nose. The length of the Eustachian tube is about two inches. One third of the tube, or that part which is towards the tympanum, has its sides formed entirely of bone. In the other two thirds, the sides of the tube are formed partly of fibro-cartilage and partly of fibrous membrane. That part of the tube which is towards the tympanum is rounded. That part which is towards the pharynx is oval. At its termination in the pharynx, the tube presents a transverse slit, the margins of which project, and are formed of fibro-cartilage. The Eustachian tube is lined throughout by mucous membrane, which is continuous at one end with the lining of the pharynx, and at the other with the lining of the tympanum.

* The use of the Eustachian tube is to convey air into the cavity of the tympanum.

**BONES IN THE CAVITY OF THE TYMPANUM,—VIZ.
MALLEUS — INCUS — OS ORBICULARE, AND
STAPES.**

THE MALLEUS, or hammer, consists of a round head, a small neck, a manubrium or handle, and two small processes—one in the neck, long, and very slender, termed *gracilis*—the other in the upper end of the handle, called *processus brevis*. The handle is by some considered as one of the processes, and is then called the longest of the three ; it forms an angle with the neck, becoming gradually smaller, and is bent at its extremity towards the *membrana tympani*; in the natural situation, the head is turned upwards and inwards, and the handle down upon the *membrana tympani*, to which it adheres.

THE INCUS, compared in its shape to an anvil, but much more resembling one of the *dentes molares* with its roots widely separated, is situated behind the malleus, and is formed of a body and two *crura* of unequal length.

The body has a cavity and two eminences, corresponding to that part of the malleus with which it is articulated. The short *crus* extends backwards, and is joined by a ligament to the edge of the mastoid opening.

The long *crus* is turned downwards, with the point somewhat flattened and bent inwards.

THE OS ORBICULARE is the smallest bone of the body, being considerably less than a grain

of mustard seed ; it is articulated with the point of the long process of the incus, and is so firmly fixed to it, that it has frequently been considered as a process of that bone.

THE STAPES is named from a striking resemblance it has to a stirrup ; it is divided into head, crura, and base. The head is placed upon a small flat neck, and is articulated with the os orbiculare. The crura, like those of the incus, are unequal in length, and have each a groove on the inside which gives insertion to a membrane stretched between them. The base is of an oval shape, and has no perforation in it ; its edges correspond with those of the fenestra ovalis, with which it is articulated. The stapes is placed horizontally, being nearly at a right angle with the inferior crus of the incus ; its two crura are placed in the same plane, the longest backwards. The small bones of the ear are articulated with each other by capsular ligaments proportioned to their size, and are covered by periosteum, which also fixes them to the membrana tympani and fenestra ovalis.

THE MUSCLES OF THE EAR. There are four in all ; of which three are attached to the malleus.

THE TENSOR TYMPANI is the largest of these ; it arises and is lodged in a groove above and parallel to the Eustachian tube, whence it emerges upon the inner and upper surface of the tym-

panum, which the tendon crosses, to be inserted into the neck of the malleus.

THE LAXATOR TYMPANI is a slender shred of muscle which arises and descends from the roof of the tympanum, to be inserted into the outside of the neck of the malleus.

THE EXTENSOR MALLEI is lodged in, and arises from the margins of the glenoid fissure ; its tendon is inserted into the long process of the malleus.

THE STAPEDIUS, which arises within a cavity in the pyramid, and is inserted into the capitellum of the stapes ; it is calculated to give tension to the membrana fenestræ ovalis.

CHORDA TYMPANI. As the portio dura of the auditory nerve passes through the stylo-mastoid canal, between the tympanum and mastoid process, it detaches a small branch through a particular canal, which opens in the back of the tympanum, near the groove that contains the membrana tympani.

The chorda tympani traverses the tympanum, lying between the manubrium of the malleus and longer crus of the incus, and enters another little canal nearly opposite to the former. It then continues its course forwards and downwards between the pterygoid muscles, and joins the lingual branch of the inferior maxillary nerve.

THE LABYRINTH is composed of the cochlea, vestibulum, and semicircular canals.

COCHLEA is a bony cavity in form of a spiral, from which it has taken its name. This cavity is divided into two others, called the gyri of the cochlea, and which are distinguished into external and internal. The partition which separates them is a plate set edgeways, and which in its whole length is partly bony and partly membranous. The external gyration communicates by the fenestra rotunda with the cavity of the tympanum. The internal gyration ends in the vestibule.

VESTIBULUM. The vestibulum is an irregular round cavity, less than the tympanum, and situated more inward and a little more forward. These two cavities are in a manner set back to back, with a common partition between them, perforated in the middle by the fenestra ovalis, by which the cavities communicate with each other. The cavity of the vestibulum is likewise perforated by several other holes ; on the back side, by the five orifices of the semicircular canals ; on the lower part of the fore side, by a hole which is one of the passages of the cochlea ; and on the fore side, toward the internal meatus auditorius, opposite to the fenestra ovalis, by a number of very small holes for the passage of the nerves ; on the upper side there are only small pores.

SEMICIRCULAR CANALS. They are three in number, and they are distinguished, according to their situation, by the terms superior, posterior, and external.

The superior and posterior canals are vertical, and the external canal is horizontal. The semicircular canals communicate at both their extremities with the vestibule. The superior and posterior canals are joined at one end; hence the three canals present only five openings in the vestibule. The diameter of each canal is such that it will just receive the head of a common-size pin.

AQUÆDUCTS. The aquæducts are two very small channels extending from the vestibule and cochlea to the external surface of the temporal bone. The aquæductus vestibuli terminates by a small slit-like opening in the posterior side of the petrous portion of the temporal bone, above and behind the meatus auditorius internus.

The aquæductus cochleæ terminates by a small conical aperture in the posterior border of the petrous portion, just below the meatus auditorius.

CONTENTS OF THE LABYRINTH. The bony walls of the labyrinth are lined by a membrane, from which a transparent, watery fluid is secreted into the several cavities. This membrane is continued through the aquæducts, and at the termination of each passage is expanded beneath the dura mater, in the form of a pouch.

Membranous sacs and tubes are contained in the several divisions of the labyrinth. Within each semicircular canal, there is a membranous tube. The three membranous tubes terminate at each

extremity in a sac, which is lodged in the vestibule. This sac, forming the centre of communication between the three semicircular membranous tubes, is named **ALVEUS COMMUNIS**.

A distinct sac, of a spheroidal form and closed on every side, is found in the vestibule. In the cochlea, very small membranous sacs are situated upon the lamina spiralis. These sacs* and tubes are formed by thin and transparent membranes. They are filled by fluid, and are immediately surrounded by the fluid which is secreted from the membranous lining of the labyrinth.

PORTIO MOLLIS† enters the meatus auditorius internus, in common with the portio dura, by two fasciculi, one belonging to the cochlea, the other to the vestibulum and semicircular canals ; these pass by numberless fibrillæ, through the cribriform plate in the bottom of the meatus auditorius internus, to the inside of the labyrinth ; the fibres are then distributed to the membranes lining the cochlea, vestibulum, and semicircular canals, and form the true auditory nerve.

* The sacs and tubes in the labyrinth are destined to receive the filaments of the auditory nerve.

† Arises from the crura cerebelli and fourth ventricle.

PLATE N. 1.

These drawings represent the ear—meatus auditorius externus — membrana tympani — bones of the ear—and the Eustachian tube.

Fig. 1.

- a.* Lobe of the ear.
- c.* Concha.
- d.* Anti-helix.
- e.* Fossa innominata.
- f.* Fossa navicularis.
- g.* Helix.
- h.* Tragus.
- i.* Anti-tragus.
- k.* Meatus auditorius externus.
- l.* Cartilaginous portion of auditory tube.
- m.* Membrana tympani.
- n.* Mastoid process.
- o.* Styloid process.
- p.* Temporal bone.
- q.* External part of the Eustachian tube.
- r.* The tube opening into the pharynx.
- s.* Zygomatic process of temporal bone.

Plate N 1.

Fig 1.

Fig 2.



W. C. C. C.

Fig. 2.

- a.* Auditory ring of the temporal bone.
- b.* Membrana tympani.
- c.* Base of stapes.
- d.* Head of the malleus.
- f.* Handle of the malleus.
- g.* Body of the incus.
- h.* Long crus of the incus.
- i.* Short anterior crus of the stapes.
- l.* Apex of the stapes.

PLATE N. 2.

Fig. 1.

The aperture of the external meatus closed by a tough membrane.

Fig. 2.

The calibre of the external meatus reduced from thickening of the cellular tissue of the canal.

- a.* Ear.
- b.* The meatus externus reduced to one-fourth its natural size.
- c.* Thickened and indurated state of the cellular tissue under the mucous membrane of the part.
- d.* Membrana tympani.

Fig 1.

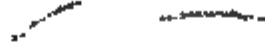


Fig.2.



Plate N 5.

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PLATE N. 3.

Fig. 1.

Deafness produced by an accumulation of indurated wax.

- a.* Ear.
- b.* The meatus externus.
- c.* Indurated wax.
- d.* The tympanum on which the wax is resting.

Fig. 2.

Ulceration of the mucous membrane of the meatus externus.

- a.* Integuments of the head.
- b.* Ulcerated state of the mucous membrane of the meatus externus.
- c.* The ear.
- d.* The styloid process.
- e.* The mastoid process.
- f.* The membrana tympani.

PLATE N. 4.

Fig. 1.

Papillated excrescences arising from the mucous membrane covering the superior and lateral portions of the tube.

- a.* The ear.
- b.b.* The diseased portions.
- c.* The meatus externus.
- d.* The membrana tympani.

Fig. 2.

Polypus arising from the mucous membrane of the meatus.

- a.* The ear.
- b.* The meatus externus.
- c.* A small polypus, one end of which is firmly attached to the superior portion of the canal, and the other is forced into the concha.

Plate N. 4.

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Fig.2.

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Figl.

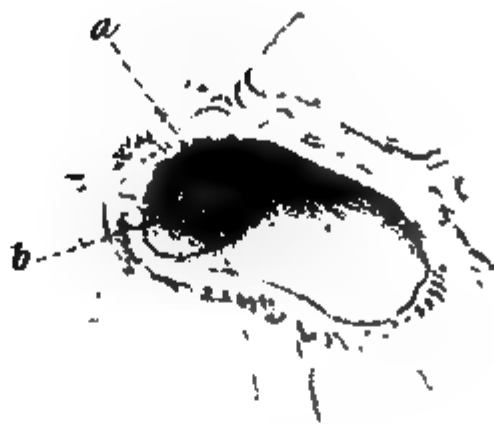


PLATE N. 5.

Fig. 1.

Ulceration of the membrana tympani.

a. Small ulcers on the superior portion of the membrane.

b. Perforation of the membrane.

Fig. 2.

Obstruction of the Eustachian tube.

a. The ear.

b. The meatus externus.

c. Membrana tympani.

d. The Eustachian tube.

e. The tube closed near its middle.

f. The opening of the tube into the pharynx.

THE METHOD OF INTRODUCING THE PROBE INTO THE EUSTACHIAN TUBE.*

Between the root of the pterygoid process and the basilar apophysis, there is a cul-de-sac, or excavation, into which the extremity of the probe might be readily insinuated, in attempting to introduce it into the tube by the middle meatus. In fact, if, when the end of the instrument gets into the pharynx, it is raised in the least degree above what is necessary, and if it does not fall exactly into the guttural canal of the tympanum, it will almost always enter this excavation—a circumstance which requires some notice, because injec-

* This canal is situated some lines behind the middle meatus of the nasal fossæ, and the notched portion of the cartilage looks forwards and upwards.

tions are frequently thrown into this place instead of the natural canal. In order to avoid this mistake, it is preferable to introduce the probe by the inferior meatus, because, when it has once got behind the extremity of the inferior turbinated bone, it will only be necessary to raise the end of it a little outwards, for it to slide almost of its own accord into the place required ; and this is occasioned by the levator palati muscle, which, as it descends in the velum palati, represents a column directed obliquely from above downwards, from behind forwards, and from without inwards.

This muscle, the pterygoid process, and the tensor palati, circumscribe a triangle with a superior base, in which the eustachian tube is enclosed ; so that when the instrument gets as far as the posterior part of the meatus, or the floor of the nasal fossæ, it is precisely in the summit of this triangle. Then, by tracing the gutter which it represents to its upper part, it will enter directly into the tube ; we must be careful, however, not to pass it beyond the fleshy pillar, as it would then be difficult to find the opening we are in search of. It is also proper to observe, that the membranous duplicature which envelopes the inferior turbinated bone, is generally lost in the superior paries of the guttural duct of the ear ; which renders the operation extremely easy, by attending to the preceding directions.*

* We should bear in mind, that this duct is directed outwards, backwards, and slightly upwards ; therefore we should give to the tubes with which we penetrate into it to any depth, whether for the purpose of breaking down obstructions or conveying injections, but a very gentle curvature.

THE ŒSOPHAGUS, ETC.

IN the healthy condition, the mucous membrane of the pharynx is smooth and with scarcely any villi on its surface, but is of a light red colour, and very vascular. In the œsophagus, it is white, thin, and thrown into longitudinal folds. In the stomach and intestines of the foetus and infant, it is of a rose colour; and of a milky and satin-like whiteness in young persons. In the adult, it assumes a slight ashy shade, especially in the duodenum and commencement of the small intestines. And lastly, in old age, this ashy shade becomes more decided and general; whilst the submucous veins, being dilated and filled with blood, lift up and impart a colour to the membrane covering them: at other times, however, in old persons who die in a decrepit and bloodless state, the mucous membrane is remarkable for its extreme paleness. The same appearances are met with in children who die of marasmus.

NOTE.—If you expose the gastro-intestinal mucous membrane, in a healthy condition, for some time to the action of a humid atmosphere; or if you rub it with something soft, so as not to tear it, as with a bit of fine sponge or linen; or if you let a stream of water fall upon it, the colour becomes slightly increased: maceration, and decoction produces an entirely opposite effect.

The mucous membrane readily alters by putrefaction, and the submucous tissue still more readily, for it is then very easily detached.

PLATE 1.

The method of introducing the Elastic Catheter into the Stomach.

- a.* The catheter introduced into the nostril.
- b.* The tongue.
- c.* Uvula.
- d.* Pharynx.
- e.* Epiglottis.
- f.* Larynx.
- g.* Thyroid gland.
- i.* Œsophagus.
- k.* Integuments.
- l.* Trachea.

Plate 1

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ŒSOPHAGOTOMY.

THE operation must be performed on the left side, and as much as possible between the thyroid gland and sternum. In order to reach the œsophagus at this point, we must cut down as if we were about to tie the carotid ; we then push this artery outwards, the sterno-thyroideus muscle forwards, and towards the median line ; a thick fibro-cellular lamina presents itself, which is next to be divided, when the canal of deglutition is exposed to view. All that is necessary is, to avoid the recurrent nerve,* and trachea.

* On the left side the gullet is more immediately covered by the thyroid gland ; it is crossed by the inferior thyroid artery, and the recurrent nerve is more upon its anterior part than on the right side, which renders the section of this cord more easy : finally, the carotid is a little nearer to it, because on the right the œsophagus is entirely covered by the trachea.

PLATE 1. *a.*

This diagram represents a perpendicular section of the face and jaw, and the method of introducing the probang into the oesophagus.

- a.* Uvula.
- b.* Tongue.
- c.* Pharynx.
- d.* Epiglottis.
- e.* The finger depressing the tongue.
- f.* Section of the lower jaw-bone.
- g.* Thyroid cartilage.
- h.* Cricoid cartilage.
- i.* The sponge of the probang pressing on the meat.
- k.* A portion of meat obstructing the passage to the stomach.

Plate 1a



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PLATE 2.

Inflammation of the Mucous Membrane of the Œsophagus.

- a. a.* Posterior fauces.
- b.* Uvula.
- c.* Tongue.
- d.* Epiglottis.
- f. f.* Inflamed surface of the mucous membrane covering the larynx.
- g.* Lymph firmly attached to the inflamed surface.
- h. h.* The Œsophagus laid open, and its cut surfaces thrown back on each side.
- i.* Portions of lymph removed, so as to expose the surface of the mucous membrane under it.
- k.* The Œsophagus.

NOTE.—The mucous membrane is found altered as to appearance and consistence: it is redder, thicker, and more pulpy than natural. The inflamed surface is sometimes lined with inspissated mucus; but more frequently, large portions of lymph are firmly attached to the diseased surface. The mucous membrane frequently secretes pure pus, without being ulcerated.

PLATE 3.

Ulceration of the Mucous Membrane of the Œsophagus.

- a.* Epiglottis.
- b.* Bag of the pharynx.
- c. c.* The Œsophagus laid open, so as to expose the ulcers, which are situated on the tracheal surface of the tube.
- d. d.* The ulcers—had not penetrated the whole substance of the tube, but simply destroyed the mucous membrane and cellular tissue between it and the muscular parietes of the Œsophagus. Their surfaces, as well as their edges, presented a rough and irregular appearance, but in no way indurated.

NOTE.—The ulcers are of limited extent, presenting an evident loss of the mucous membrane and cellular tissue of the part, surrounded by edges which are irregular but not elevated. These excavations are so well defined, that they appear to the eye as if the parts had been removed by a careful dissection. Sometimes the bottom of the ulcer is covered with a tough yellowish matter. The mucous membrane surrounding the ulcers, is of a purplish red colour; and if the cellular tissue be minutely examined, the capillary veins coursing through it, will be found to be dilated and tortuous.

See page 917 to 920.

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PLATE 4.

Stricture, from Puckering of the Mucous Membrane of the Œsophagus.

- a.* Uvula.
- b.b.* Fauces.
- c.* Tongue.
- d.* Epiglottis.
- e.* Puckered state of the mucous membrane.
- f.* Larynx.
- g.* A bougie, passed through the stricture.
- h.* Contracted state of the mucous membrane.
- k.* Muscular coat of the œsophagus, separated from the mucous membrane, and thrown back.
- l.l.* The internal surface of the tube.

NOTE.—In those cases, the mucous membrane is very much puckered at a particular part, so as to reduce its calibre. The membrane above and below the strictured portion, is thickened, and slightly indurated; and the cellular membrane in the neighbourhood of the disease, is thickened, and presents, when cut, a smooth surface, but of a fibro-cartilaginous texture. In congenital stricture of the mucous membrane of the œsophagus, it is but slightly puckered; and the cellular tissue, as well as the muscular parietes of the tube surrounding the contracted portion, are healthy.

PLATE 5.

Contraction of the Calibre of the Œsophagus.

An extensive contraction of the calibre of the œsophagus, at the cardiac extremity of the stomach, from scirrhus.

- a. a.* The œsophagus very much dilated; and just above the stricture there were two pouches, capable of containing two ounces of fluid—the superior was the larger.
- b.* The calibre of the œsophagus, so contracted as to prevent any thing but fluid to pass, and that with the greatest difficulty.
- c.* The cut surfaces of the diseased mass, shewing the indurated bands of cellular tissue that intersect it.
- d.* Lobulated appearance of the tumour within the cardiac extremity of the stomach.
- e. e.* Fibro-cartilaginous matter, deposited between the mucous and muscular textures of the stomach.

See page 919.

Plate 5

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- f.* Corrugated and thickened state of the mucous membrane of the stomach.
- g.* Peritoneal coat.
- h.* Muscular coat.
- i.* Mucous coat.

NOTE.—Scirrhus, with ulceration.—The parietes of the œsophagus are thickened, hard, and transformed into a scirrhus substance. The mucous and muscular coats are almost always distinct, though degenerated; at least, whenever the scirrhus does not become softened, one or more ulcers, with thick, hard and everted edges, present themselves; their surface is unequal, granular, or fungous. The calibre of the tube is narrowed by the thickening of its walls; sometimes the degenerated parts retain the cylindrical form of the œsophagus; sometimes it is changed into an irregular shaped mass, adhering to the trachea, to the lungs, or even to the dorsal vertebræ.

PLATE 6.

Represents the cardiac extremity of the stomach, embedded in an encephaloid tumour, which was the cause of stricture at that point. In order to exhibit the contracted state of the œsophagus, the puckering of its mucous membrane, and the internal part of the tumour, a section was made so as to divide them into two equal parts, leaving the upper and posterior portion of the fundus of the stomach *in situ*.

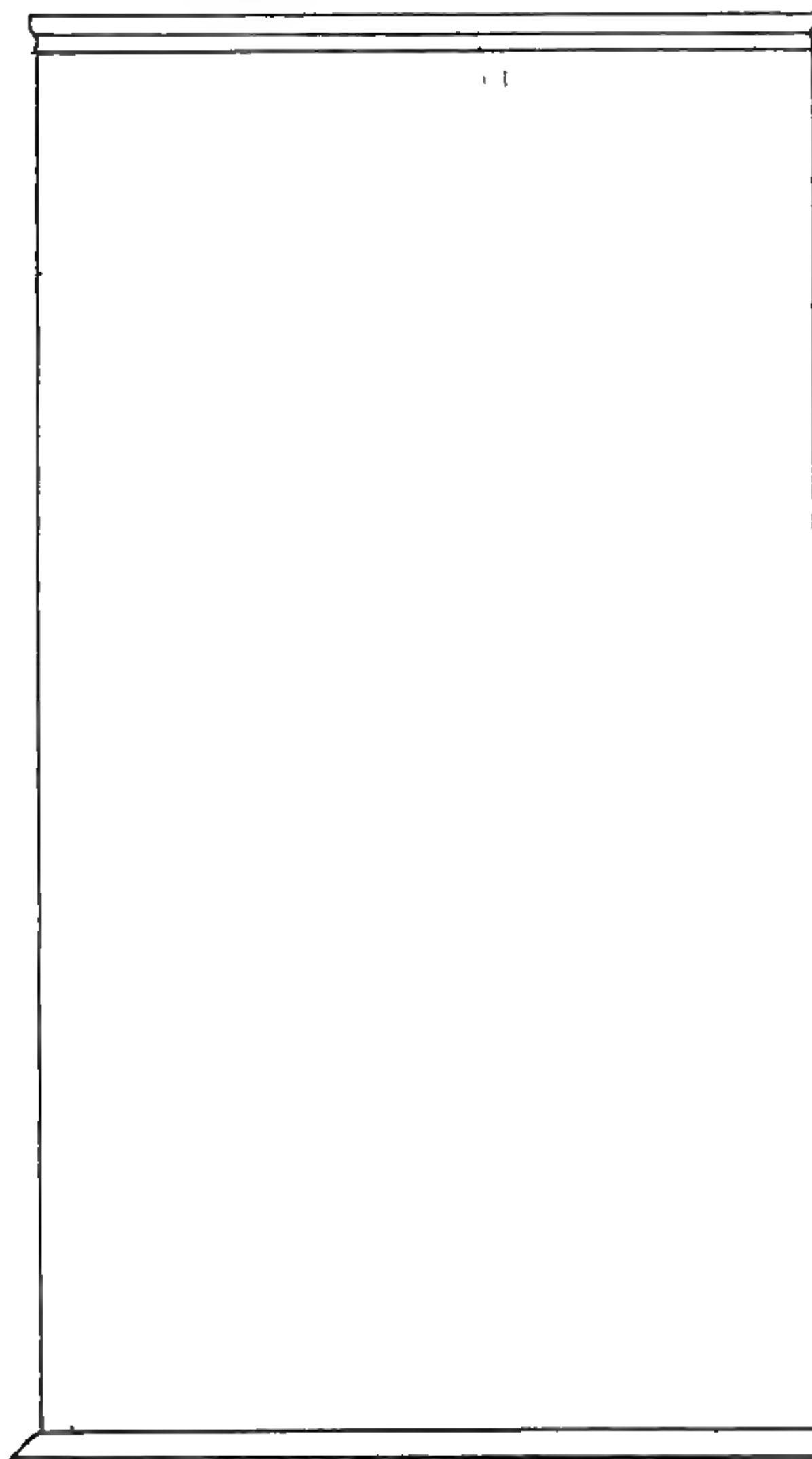
a.a. The œsophagus and tumour slightly stretched, and kept open by several pieces of whale-bone; consequently, the inflamed and puckered state of the mucous membrane are beautifully exhibited, within the precincts of the tumour.

b.b.b.b. Lobulated state of the tumour.

c.c.c.c. The condensed cellular bands, which intersect the tumour.

d.d.d. Medullary portion of tumour.

e.e. The serous envelope of the encephaloid mass.



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PLATE 7.

Polypus, arising from the Mucous Membrane near the Rima Glottidis.

- a.* A portion of the tongue.
- b.* Pharynx.
- c.* Epiglottis.
- d.* Os hyoides.
- e.* Thyroid cartilage.
- g.* Ventricle of the larynx.
- h.* Trachea.
- i.* Œsophagus.
- k.* The tumour, hanging from the mucous membrane of the larynx.
- l.* A portion of the œsophagus removed so as to expose the tumour.

NOTE.—Polypus is a tumour, varying in size and shape, and generally takes its origin from the cellular tissue of the part. It is suspended or supported either by a narrow neck or a broad basis, of an oval or pyriform figure, presenting an unequal or knobby surface, varying in colour from a rich red to a dark purple; and when sliced, exhibits a bright red, intersected by bluish or purplish patches. It is covered by a thin capsule, which

f.f. Mucous membrane of the stomach.

NOTE.—An encephaloid tumour, in a state of crudity, forms masses of various sizes, each of which is lobed and lobulated; numerous very minute vessels ramify in the cellular tissue, and the cerebreform substance itself.

The coats of these blood-vessels are very fine, and easily ruptured; and this accident gives rise to clots of extravasated blood within the tumours. In its perfect state it is homogeneous, and of a milk-white appearance.

In different parts it has commonly a slight rose tint. It is opaque, when examined in masses; but in thin slices, it is in a slight degree semitransparent.

In consistence it is like the human brain, but is commonly less coherent, more easily broken and comminuted by the fingers.

Plate 3.

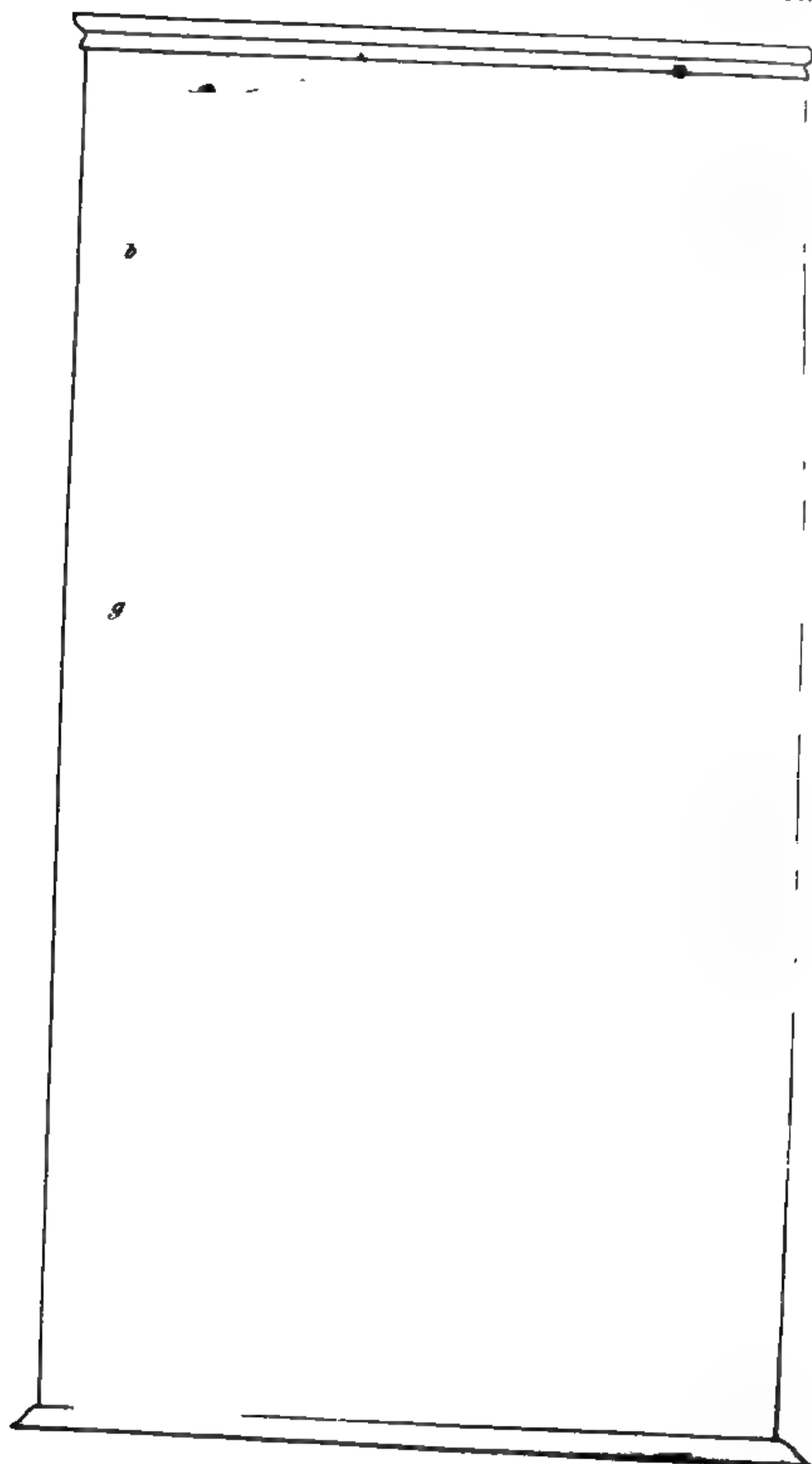


PLATE 8.

Represents a pouch formed at the upper end of the œsophagus of an infant.

- a.* Tongue.
- b.* The pouch distended.
- c.* Trachea.
- d.* Os hyoides.
- e.* Thyroid cartilage.
- f.* Cricoid cartilage.
- g.* The natural appearance of the œsophagus completely destroyed, and representing a string of condensed cellular tissue.
- h.* Cardiac extremity of the œsophagus.
- i.* Stomach.
- k.* Pyloric extremity of the stomach.

NOTE.—This rare and valuable specimen was in the possession of the late Mr. Hallem, of Walworth.

is abundantly supplied with vessels, as well as with the mucous membrane.

Polypi are sometimes so soft, as to be lacerated and bleed on the slightest touch ; at other times, they are very compact, and even scirrhus. Polypi of the mucous membranes, and of the erectile productions, which are sometimes accidentally developed in their thickness, as well as the cartilaginous and osseous metamorphoses, may be referred to chronic inflammation.

Vegetations, of various forms and sizes, are sometimes found shooting up from the internal surface of the œsophagus, narrowing the passage, and offering a greater or less obstruction to the act of deglutition ; when sliced, they frequently present a bright red, intersected by bluish lines, and are of a spongy texture, and soft to the touch.

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